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REPORT OF RESULTS

PROJECT AF 61-2 **EASTERN PACIFIC SURVEY**



15 JUNE 1963

AIR PHOTOGRAPHIC & CHARTING SERVICE (MATS)

FINAL REPORT

HAWAIIAN GRAVITY SURVEY

MARCH 1963

Prepared by Data Reduction Division

APPROVED:

MARRY G. PETERSON, Colonel, USAF Commander

1381ST GEODETIC SURVEY SQUADRON (MISSILE) AIR PHOTOGRAPHIC AND CHARTING SERVICE UNITED STATES AIR FORCE Orlando Air Force Base, Florida

ABSTRACT

This report contains computations and results for the gravity survey accomplished by the 1381st Geodetic Survey Squadron (Missile) in support of the Hawaiian HIRAN Project, AF 61-2. The gravity work includes base station surveys and observations along level lines. The base station to which all final data is referred is the MATS terminal base station located at Hickam AFB, Hawaii. To obtain gravity values referred to the first order pendulum station in the Bishop Museum, subtract 0.9 mgals from the values contained in this report.

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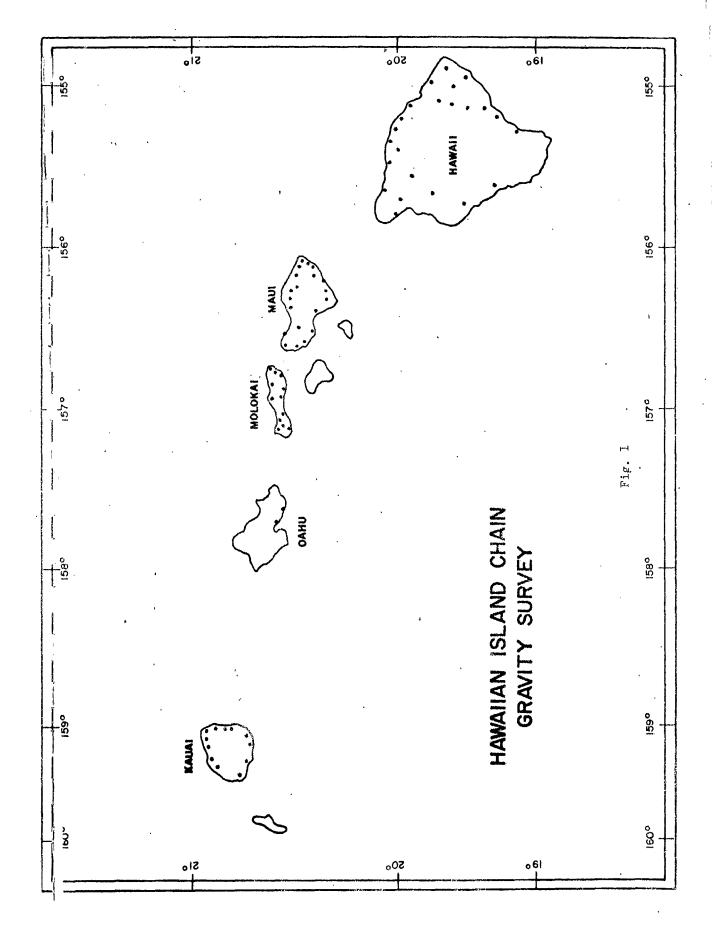
Page No. ABSTRACT INTRODUCTION...... Figures 1 and 2: Gravity Survey Plots..... Figures 3 - 8: Main Loop Sketches INSTRUMENTS..... SPECIFICATIONS SURVEY OPERATIONS COMPUTATIONS.... ABSTRACTS OF GRAVITY DATA..... ACCURACY OF THE RESULTS..... CONCLUSTORS SECURITY CLASSIFICATION..... APPENDIX A- TABULATED DATA Abstract of Gravity Data..... Comparison of Wisconsin and 1381st GSS(M) Data..... Tables of Dial Factors..... Least Squares Adjustment of Gravity Observations Gravity Difference Comparison: Loop Versus Single Drift Rate..... Mean Gravity Difference Comparison: Loop Versus Single Drift Rate..... APPENDIX B - LOOP COMPUTATIONS..... APPENDIX C - STATION DESCRIPTIONS.......... REFERENCES.....

INTRODUCTION

The gravity survey covered in this report was undertaken to obtain gravity data along and in the vicinity of the Hawaiian Island chain using transportation on an availability basis from the Hawaiian HIRAN Project, 61-2. The data acquired by the 1381st Geodetic Survey Squadron (Missile) in the Hawaiian area will in time contribute to the determination of geoid undulations in the area. Gravity base stations were established or reoccupied on the islands of Kure, Midway, Johnston, Lisianski, Laysan, French Frigate Shoals, Lanai, Oahu, Molokai, Maui, Kauai, and Hawaii; in addition, gravity observations were made along the USGS level lines on the last four islands. The stations observed are shown in figures 1 and 2, and the main loop schemes are given in figures 3-8.

All gravity survey data acquired during the project was reduced by the 1381st GSS(M).

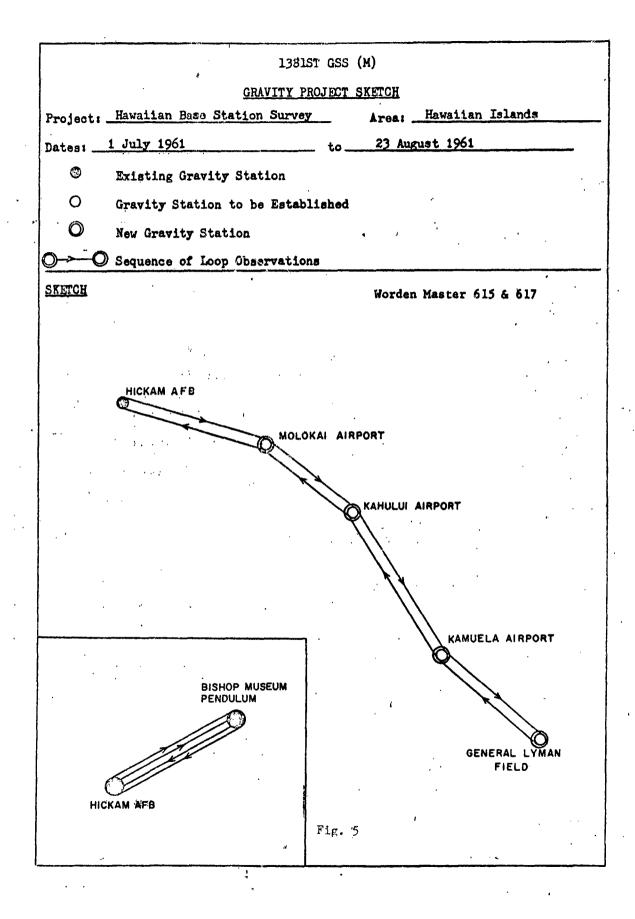
The gravity survey program and specifications were prepared by the Air Photographic and Charting Service (APCS) and are contained in Addendum Nr. 1 to APCS OPLAN 502-61, dated 22 June 1961.



GENERAL LYMAN FIELD UPOLU POINT APT. KAHULUI APT. HANA APT. GRAVITY BASE STATIONS (NOT TO SCALE) HAWAIIAN ISLAND CHAIN KONA APT KAMUELA APT-BISHOP MOSEUM SPT. MOLOKAI APT. PEARL HARBOR HICKAM AFB LINUE APT. BONHAM ALF O FRENCH FRIGATE SHOALS OLAYSAN ISLAND & STA. LAYSAN ISLAND BEACH STA. LISIANSKI ISLAND CAGS STA. C JOHNSTON ISLAND SOUTHEAST ISLAND MIDWAY U.S. NAVAL STA. WURE ISLAND

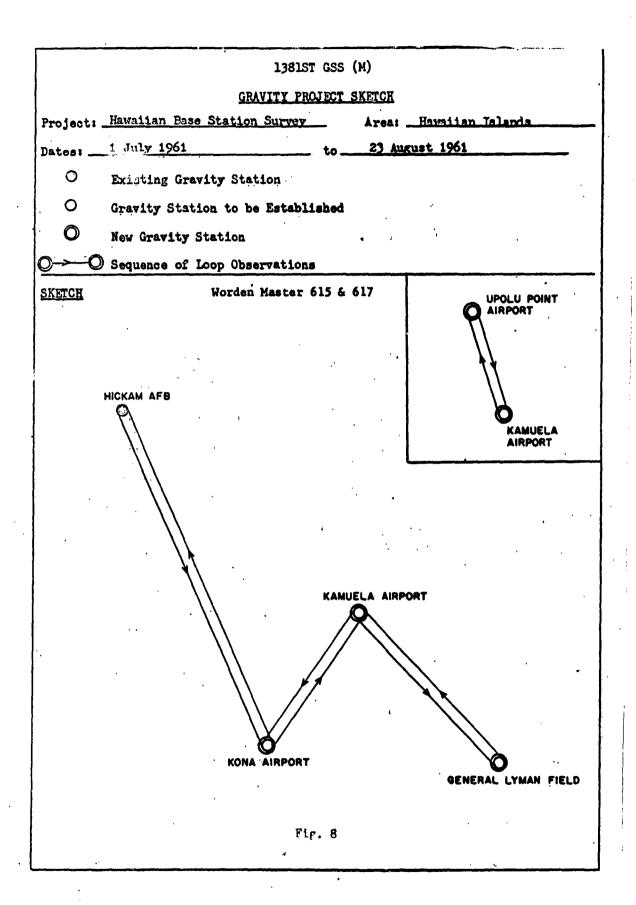
		1381ST GSS	(M)	
		GRAVITY PROJECT	SKETCH	
Project:	Hawaiian Base	Station Survey	Area: <u>Hawaiian Islands</u>	
Dates:	1 July 1961	to	23 August 1961	
0	Existing Gravity	y Station		
. 0	Gravity Station	to be Established	•	
	New Gravity Star	tion		
$\bigcirc\!$	Sequence of Loo	p Observations		
SKETCH	٠.	•	Worden Master 615 & 617	•
	MIDWAY ISLAND MIDWAY OLD OPS BLDG	JOHNSTO ISLAND	ON .	KAM AF
L				٠,

1381ST GSS (M) GRAVITY PROJECT SKETCH Project: Hawaiian Base Station Survey Area: Hawaiian Islands Dates: 1 July 1961 0 Existing Gravity Station 0 Gravity Station to be Established New Gravity Station O Sequence of Loop Observations SKETCH Worden Master 615 & 617 FRENCH FRIGATE SHOALS BONHAM HICKAM AFB Fig. 4



1381ST GSS (M) GRAVITY PROJECT SKETCH Project: Hawaiian Base Station Survey Area: Hawaiian Islands 1 July 1961 23 August 1961 Dates: _ 0 Existing Gravity Station 0 Gravity Station to be Established 0 New Gravity Station Sequence of Loop Observations SKETCH Worden Master 615 & 617 BONHAM LIHUE AIRPORT HICKAM AFB Fig. 6

1381ST GSS (M) GRAVITY PROJECT SKETCH Project: Hawaiian Base Station Survey Area: Hawaiian Islands 1 July 1961 23 August 1961 Dates: _ 0 Existing Gravity Station 0 Gravity Station to be Established 0 New Gravity Station Sequence of Loop Observations SKETCH Worden Master 615 & 617 HICKAM AFB MOLOKAI AIRPORT KAHULUI AIRPORT LANAI AIRPORT HANA AIRPORT Fig. 7



INSTRUMENTS

Two Worden Master gravity meters were used for the survey. These instruments, numbered 615 and 617, are of the unstable type and have a three piece quartz spring element. Each instrument has a single dial of 2200 dial units range or over 1500 mgals without reset. The effects of temperature on instrument drift variability and rate is minimized by means of the insulating vacuum flask protecting the instrument, the temperature variation compensation system, and the low powered temperature stabilization system which provides actual temperature control. The quartz spring element is sealed in partial vacuum (about seven mm) for protection against contamination and to minimize the effects of changing atmospheric pressure. The weight of an instrument with its carrying case, battery charger and other associated equipment is about 25 pounds.

Instrument calibration and linearity of instrument drift are discussed in the Computations Section.

SPECIFICATIONS

The following specifications for the gravity survey were extracted from Annex Alfa of Addendum Nr. 1 to APCS OPLAN 502-61, dated 22 June 1961:

1. Second-order gravity base stations will be established with an accuracy of 0.5 milligal relative to the first-order gravity base located in Bishop Museum, in Honolulu, Hawaii.

- 2. Gravity meters used in this work will be calibrated before and after the field survey over appropriate base stations of the North American Calibration Range.
- 3. Second-Order gravity base stations will be described on 1381st Form 23, of March 61. (See Tab A, Appendix II)
- 4. Regional gravity stations will be established on previously described level bench marks and will be tied to the second-order gravity base network to an accuracy of 0.5 milligal. In general, these stations will be established at intervals of five miles along the existing level lines in areas where existing gravity data is inadequate for regional coverage.
- 5. Elevations of second-order and regional gravity stations will be determined to an accuracy of $\frac{1}{2}$ 10 feet with reference to mean sea level. This is a minimum requirement for accuracy, the maximum useful accuracy is $\frac{1}{2}$ 1 foot.
- 6. Geographic coordinates for gravity stations will be scaled from existing maps. Desirable accuracy for these coordinates is ± 0.1 minute of arc.

SURVEY OPERATIONS

The Hawaiian area gravity survey was accomplished during the period July - August 1961. The order of survey and mode of transportation were Laysan Island, Lisianski, Southeast Island, Midway, French Frigate Shoals and Johnston Island using IST and aircraft transportation; airport bases in the Hawaiian area, Kure and Midway Islands using aircraft transportation; and regional surveys of

Kauai, Molokai, Maui and Hawaii using jeep transportation. Closures obtained may be seen from the loop computations in appendix B and are discussed in the computation section of the report. The loop base stations used for the Hawaiian project were: Hickam AFB, Molokai, Kahului, and Kanuela Airports.

The gravity stations established along level lines at 5 to 10 mile intervals were referenced to the base stations established in the survey. The descriptions for many of the benchmarks recovered and used are contained in the USGS Bulletin 561, "Results of Spirit Leveling in Hawaii, 1910-1913".

COMPUTATIONS

obtained after correcting observations for non travel drift and tidal effects. Travel drift corrections for each observation were then obtained by prorating the above loop closures on the basis of elapsed travel time of observation from the loop base station. With the exception of a Hickam AFB to Midway loop which took over a week to complete and had a closure of - 2.53 mgals, the longest travel time spent on a loop was slightly less than a day. The maximum closure obtained, again excluding the Hickam - Midway loop, was - 1.22 mgals. The average travel time for loop completion was about eight hours and average closure without regard to sign was 0.20 mgals.

The "Tidal Gravity Effect Tables" published by the Houston

Technical Laboratories were used to determine and remove the effect
of the attraction of the sun and moon on the gravity measurements.

After correcting for tidal effects, drift during stops or delays
and drift during travel, gravity differences between each station
and the loop base station were computed.

The table of dial factors which was used for Worden Master gravity meter 617 and the single factor used for 615 are given in Appendix A. The single dial factor for 615 resulted from a calibration against a number of Professor Woollard's airport gravity base values in the United States. The dial factors for 617 were determined from instrument measurements taken at sites between Key West, Florida and Charleston, South Carolina which were established with a prospecting type Worden Master gravity meter. The resulting dial factors were then corrected for scale error using data from observations made at stations established by the University of Wisconsin. The Wisconsin stations used were Orlando, Atlanta, Chattanooga, Washington, Philadelphia, McGuire AFB, and Jacksonville.

Subsequent recalibration computations based on observations over an extended range from Bogota, Colombia to Hanscom Field, Massachusetts has produced scale changes in the dial factors used for the Hawaiian project of less than 1 part in 3000 for 617 and essentially no change for 615. The loop computations were not redone using the new calibration data since changes in the final values would have been of the order of 0.1 mgals or less.

To supply additional data from which an assessment of the quality of the survey data could be made a least squares straight line adjustment of 13 observations at Hickam AFB was made. These observations, made during the period 6 July to 7 August 1961, exhibited a near linear drift rate. For instrument 615 a drift rate of 0.5307 \pm 0.0047 mgals per day was determined. The mean residual (departure of observations from a straight line) taken without regard to high was less than 0.1 mgals for the 13 observations. The drift rate for 617 was determined to be 0.3360 \pm 0.0029 with a mean residual of less than 0.1 mgals.

These results were very encouraging from the standpoint of justification of linear removal of drift with respect to time and have prompted reconsideration of the necessity of completing loops in minimum time. The gravity values (differences with respect to Hickam AFB) computed from the least squares drift rate were compared with the values computed by the conventional loop computation (Appendix B) and the results are tabulated in Appendix A. The average difference without regard to sign between mean values from the two methods was only 0.04 mgals. The agreement between instruments without regard to sign for observations taken during the 6 July to 7 August period was 0.14 mgals for the loop computation method and 0.15 mgals for the least squares drift rate method. The above insignificant difference between average agreements indicates that the two methods are of comparable validity. With the least squares drift rate method, the larger differences were obtained for the observations at higher elevation indicating that temperature and pressure changes affected the instrument readings. Since pressure and temperature response characteristics

of the instrument can be determined and compensated for the least squares drift rate method may yield a greater degree of consistency and reliability for the computed data.

ABSTRACTS OF GRAVITY DATA

All gravity values given in this report are referred to the Hickam AFB station whose gravity meter Potsdam system value is 978,933.7 mgals. Based on this value at Hickam AFB a gravity meter value for the first order station at the Bishop Museum of 978,952.9 mgals was determined which differed from the Wisconsin gravity meter value by 0.1 mgals. The Wisconsin pendulum value for the Bishop Museum is 978,952.0², therefore, if gravity results referred to the pendulum value are desired a - 0.9 mgal correction must be made to the values given in this report.

Horizontal and vertical positions, their source, and estimates of their accuracy are contained in the base station descriptions given in Appendix C.

ACCURACY OF RESULTS

The average agreement between instruments of $^{\pm}$ 0.2 mgals, the agreement of observations from different loops at common sites, the verification of dial factors used through subsequent recalibration computations, the small residuals obtained in the least squares drift rate computation and the loop closures obtained indicate an accuracy better than the 0.5 mgals specified for the survey. Comparisons between the survey results and University of Wisconsin values at common stations (Appendix A) produced a maximum difference of 0.3 mgals and a scale difference of about 1 part in 1500.

CONCLUSIONS

The completed Hawaiian gravity survey has satisfied the specifications given in this report with the exception of the calibration of instruments on the North American line before and after the survey. This exception was due to the fact that transportation availability and other gravity survey project considerations caused the East Coast Calibration line (ECCL)³ to be used instead of the North American. After the North American, East Coast and other gravity meter calibration lines located throughout the world are interrelated and a world calibration standard is adopted, the Hawaiian survey could be recomputed if the ECCL is changed significantly, however, present data indicates a relatively close agreement between the ECCL and other calibration lines which should make changes in the ECCL based on the adoption of a uniform calibration standard very small.

A Network of 21 base stations was established throughout the Hawaiian Island chain to an accuracy of \pm 0.5 mgals relative to the Hickam AFB or Bishop Museum site. A total of 67 gravity stations have been established along level lines on the Islands of Hawaii, Molokai, Maui and Kanai to contribute to regional coverage of the area. The accuracy of these stations with respect to Hickam AFB Bishop Museum is also estimated to be \pm 0.5 mgals.

The least squares drift rate method of determining final gravity values appears to be well suited for computation of gegional type surveys where a large number of observations are involved. It appears that loop survey completion time can be increased to several days or even a week without a significant decrease in accuracy of the

gravity values established in a regional survey. The computational procedure is considerably simplified and gravity values can be more readily determined using the least squares method. Where greater accuracy is desired with this or any other computational method, the pressure and temperature response characteristics can be determined and appropriate corrections made.

SECURITY CLASSIFICATION

All data given in this report is unclassified in accordance with Addendum Nr. 1 to APCS OPIAN 502-61, dated 22 June 1961.

REFERENCES

- 1. Weellard, G. P., "Results for a Gravity Control Network at Airports in the United States", Geophysics, Vol. XXII, No. 3, July 1958.
- 2. Woollard, G. P., and Rose J. C., "Final Report on Gravity Program", Reference No. 60-26, Woods Hale Oceanographic Institution, 1960.
- 3. Whalen, C. T., and Lofaro, R. J., "The East Coast Gravity Meter Calibration Line", presented at 1962 St. Louis ACSM-ASP Meeting, September 1962.
- 4. Woollard, G. P., Longfield, R., and Carlson, B., "Gravity Standardization Studies, Final Report", Reference No. 62-23, Woods Hale Oceanographic Institution, 1962.

APPENDIX A

TABULATED DATA

- 1. Abstract of Gravity
- 2. Comparison of Wisconsin and 1381st GSS(M) Data
- 3. Table of Dial Factors
- 4. Least Squares Adjustment of Gravity Observations
- 5. Gravity Difference Comparison: Loop Versus Single Drift Rate
- 6. Mean Gravity Difference Comparison: Loop Versus Single Drift Rate

1381st Geodetic Survey Squadron (Missile) AIR PHOTOGRAPHIC AND CHARTING SERVICE UNITED STATES AIR FORCE Orlando Air Force Base, Florida

PROJECT APCS 502-61

ABSTRACT OF GRAVITY DATA

	Ins	t. 615	Įn	st. 617	
	ΔG	Observed	.ΔG	Observed	Mean
STATION	Mgals	Gravity	Mgals	Gravity	Gravity
Hickam MATS Term.	Base	978,933. 7	Base		978,933.7
Molokai Airport	+25.8	9 59.5	+25.8	959.5	959.5
Kualapuu USGS					
BM "878"	-17.4	916.3	-17.3	916.4	916.4
Kalaupapa Lookout	-81.3	852.4	-81.1	852.6	852.5
Kaunakakai USGS BM	+25.2	958.9	+25.2	. 958.9	958.9
Hwy 45 Bridge	+16.6	950.3	+16.6	950.3	950,3
Kamalo USGS BM "39"	+15.9	949.6	+16.1	949.8	949.7
Pukoo Fishpond	+19.5	953.2	+19.4	953,1	953.2
Kanaha Point USGS	•				
BM "48"	+21.7	955,4	* +21.8	9 55,5	955.4
Halawa USGS BM "25"	+29.1	962.8	+29.2	962.9	962.8
Puunana Reservoir					
USGS BM	-35.6	898.1	~35.5	898,2	898.2
Maunaloa USGS			-		•
BM "1102"	-28.0	905.7	-27.7	. 906.0	905.8
Waieli Trian. Sta.	-5.9	927.8	-5.8	927.9	927.8
Kaeo Trian. Sta.	-14.7	919.0	-14.6	919.1	
Lanai Airport	-85.8	847.9	-85.5	848.2	
Hana Airport	-225	931.2	- 2.7	931.0	
Kahului Airport	-44.1	889.6	-44.1	889.6	
Kahakuloa USGS BM	-37.6	896.1	-37.7	896.0	
Honokowai Hwy 30	-29.7	904.0	-29.7	904.0	
Lahaina USGS	-35.9	897.8	-35.8	897.9	
Olowalu Bridge	-36.1	897.6	-36.1	897.6	
Intersection Hwy 30					
& Hwy 31	-47.3	886.4	-47.3	886.4	886.4
Wailuku Courthouse	-51.4	882.3	-51.3	882.4	
Hwy 37 Makena Junctio		, -	•		
Hwy 31	-155.2	778.5	-154.9	778.8	778.6
Kepuni Bridge			-93,1	840.6	
Puu Maneoneo Trian.					
Sta.	-62.5	871.2	-62.7	871.0	871.1
Kipahulu USGS BM 192	-34.4	899.3	-34.6	899.1	899.2
Muolea USGS BM 335	-28.0	905.7	-28.2	905.5	
Nahiku USGS BM 44-M-		/	,=,=		
1923 on Bridge	-61.5	872.2	-61.5	872.2	872.2
Koolau Ditch Intake	-88.7	845.0	-88.6	845.1	845.0
	00.,	. 575,6	-00,0	0-73,1	0, 2,0

)	Inst.	615		st. 617	
'	ΔG	Observed	ΔG	Observed	Mean
STATION	Mgala	Gravity	Mgals	Gravity	Gravity
Kailua USGS BM M-11	_	,			
1923	-64.1	978,869.6	~64. 0	978,869.7	978,869.6
Haiku USGS BM	-56.1	877.6	-56.2	877.5	877.6
Makawae USGS RM	-122.8	81 0.9	-122.5	811.2	811.0
Upper Paia USC&GS B	M49.3	884.4	-49.1	884.6	884.5
Kihei USC&GS BM	-37.5	896.2	-37.5	896.2	896.2
Haleakala Crater	-634.7	299.0	-634.0	299.7	299.4
Haleakala USC&GS					
Trian. Sta.Koleko	1ë-662.0	889.6	-661.2	228.4	
Kona Airport	_ 84.8	848.9	-84.6	849,1	849.0
Kamulela Airport	-160.8	772.9	-160.2	773.5	773.2
Bishop Museum	+19.2	952.9	+19.2	952.9	952.9
Hilo Gen.Lyman Fiel		875.5	+102.0	875.2	875.4
Hwy 19 S. of Pepeek					
Jet	+955	868.7	+95.3	868.5	
Nanue Bridge	+127.6	900.8	+127.2	900.4	900.6
Kilau Bridge	+111.7	884.9	+111.4	884.6	
Wapunahina Bridge	+104.3	877.5	+104.0	877.2	
Honokaa	+83.9	857.1	+83.7	856.9	
Kukuihaele	+110.7	, 883.9	+110.5	883,7	
Waimea	-32.4	740.8	-32.4	740.8	740.8
Upolu Airport	+102.5	, 8757	±102.2	875.4	875.6
Manukona Landing	÷97.0	870.2	+96.7	869.9	870.0
Halawa	+112.0	885.2	+111.8	885.0	885.1
Makahuna Bridge	+123.3	896.5	+122.8	896.0	
Keaau	+85.8	. 859. 0	+85.6	858.8	
Pahoa	+78.4	. 851.6	+78.3	851.5	851.6
Kalapana	+93.9	867.1	+93.6	866.8	867.0
Pohoki	+99.0	872.2	+99.0	872.2	872.2
. Pahala	+25.4	798.6	+25.4	798. <i>6</i>	798.6
Hilea	+73.3	846.5	+73.2	846.4	846.4
Naalehu	+44 <u>.</u> 0	817.2	+43.9	8.17.1	
Ke a lakekua	+0.7	773.9	+0.7	773.9	773.9
Puuanahulu	-58.4	714.8	-58.2	715.0	714.9
Auwaiakeakua Bridge		722.9	50.3	722.9	722.9
Waikii	-172.3	600.9	-172.2	601.0	601.0
USGS BM Hwy 2.8 mil					
S. of Mtn View	-15.7	757.5	~15.6	₂ 757.6	757.6
Volcano House	-102.1	671.1	-101.9	671.3	671.2
Hwy 11 USGS BM 3640	-84.8	688.4	84.8	688.4	688.4
Lihue Airport	+103.9	979,037.6	+103.8	979,037.5	979,037.6
K-1 Bridge	+73.4	007.1	+73.2	006.9	. 007.0
Kalahed USGS BM 700		978,976.9	+43.2		978,976.9
Port Allen USGS BM		979,004.5	+70.6	979,004.3	979,004.4
Waimea USGS BM 9	+87.5	021.2	+87. 1	020.8	021.0
Wailua Bridge	+127.4	061.1	+127.2	060.9	061.0
Kapaa Armory	+124.4	058.1	+124.2	057.9	058.0
Kahala Point Light					
House	+116.3	050.0	+116.1	049.8	049.9

		Inst.	615	Inst	617	
		ΔG	Observed	ΔG	Observed	
1	STATION	Mgals	Gravity	Mgala	Gravity	Gravity
i	Koolau School	+110.6	979,044.3	+110.3	979,044.0	979,044.2
	Kilauea Tele. Exc.	<i>+</i> 111,0	044.7	+110.8	044.5	044.6
1	Hanalei Bridge					
1	USGS BM 17	+136.5	070.2	+136.2	069.9	070.0
i	Wainiha Power House					
	USGS BM 101	+139.7	073.4		073.3	
ł	Kokee 109 AC&W Sta	-166.1	978,767.6		978,768.1	
	Midway Gate 2	+560.94	979,494.6	+561.03	979,494.7	979,494.6
	Kure Island	+606.04	539.7		539.7	539.7
ì	Midway Old Ops.	+565.28	499.0	*565.37	499.1	499.0
j	Johnson Island	-214.09	978,719.6	-214.10	978,719.6	978,719.6
1	A.L.F. Bonham	+120.90	979,054.6	+120.87	979,054.6	979,054.6
	French Frigate					
Į.	Shoals	+246.16	179.9	+246.01	179.7	179.8
	Pearl Harbor					
	Berth M-3	+04.8	978,938.5	+04.9	978,938.6	978,938.6
f	Laysan Island					
	Top of Beach	+369.1	979,302.8	+369.1	979,302.8	979,302.8
,	Laysam Island					
Ţ	Triam. Sta.	+368.4	302.1	+3685	302.2	302.2
	Lisiawski Is.					
•	C&GS Sta.	+421.7	355.4	+421.7	355.4	355.4
	Lisiawski Is.					
1	Top of Beach	+422.8	356.5	+422.9	356.6	356.6
	Southeast Is.					
	Pearl & Herms	+510.3	444 ° 0	+510.2	443.9	444., 0
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1381st Geodetic Survey Squadron (Missile) AIR PHOTOGRAPHIC AND CHARTING SERVICE UNITED STATES AIR FORCE Orlando Air Force Base, Florida

COMPARISON OF 1381ST GSS(M) AND UNIVERSITY OF WISCONSIN VALUES AT COMMON SITES

STATION	University of Wisconsin	1381et	Difference
-	Mga 1s	Mgals	Mgals
Hickam AFB	978,933,7	9.78,933,7	
Bishop Museum	978,953.0	978,952.9	+0.1
Johnston Island	978,719.8	978,719.6	+0.2
Midway Island	978,499.3	978,499.0	+0.3

TABLE OF DIAL FACTORS AND GRAVITY VALUES PER TURN FOR WORDEN MASTER GRAVITY METERS

	No.	616	No. 6	17
DIAL TURNS	DIAL FACTOR	MGAL VALUE	DIAL FACTOR	, MGAIL VALUE
0	. 6932	0.00	.6934	0.00
1	.6921	69.32	. 6943	69.34
· 2	. 6905	138.53	. 6946	. 138.77
· 3	. 6899	207.58	. 6944	208.23
4	. 6906	276.57	. 6938	277.67
· 5	.6919	345.63	.6936	347.05
6	. 6925	414,82	.6934	416.41
7	.6921	484.07	.6937	485.75
8 .	.6911	553,28	.6943	555.12
9	.6911	622.39	.6948	624.55
10	.6921	691.50	.6950	694.03
. 11	.6928	760.71	. 6945	763.53
12	6920	829,99	.6937	832.98
13	.6905	899.19	.6929	902.35
14	. 6893	968.24	.6925	971.64
15	.6897	1,037.17	.6927	1,040.89
· 16	.6911	1,106.14	.6933	1,110.16
. 17	. 6923	1,175.25	.6942	1,179.49
18	.6921	1,244.48	.6944	1,248.91
19	.6914	1,313.69	.6944	1,318.35
.20	.6918	1,382.83	.6940	1,387.79
21	.6929	1,452.01	. 6934	1,457.19
22		1,521.30		1,526,53

A single factor of 0.69594 will be used for Instrument No. 615

Dial factors were determined from the results of the Key West — Charleston Line, based on the factory tilt table calibration of Worden Master No. 545. These dial factors (and mgal values) were then corrected — 3.62 mgals/1000 mgals for No. 616 and —3.12 mgals/1000 mgals for No. 617 based on a least square straight line fit of results of the 6 October — 16 November 1960 trip over stations Orlando—1, Atlanta, Chattanooga, Washington D.C. Airport, Philadelphia, McGuire and Jacksonville, to W.H.O.I. results for these same stations published in their "Final Report on Gravity Program" Ref. No. 60-26, July 1960.

Computed by: C. T. Whalen, 9 June 1961 Checked by: W. H. Radtke, 12 June 1961 Copy Checked by: C. T. Whalen, 12 June 1961

STRICK NAME AND GRANTS AND	5-7-1	CAST COLARE	1 1	AC JSL NT	N	JF _F	PR/T	¥. Y	*1ETER	£-38	3SETVATIONC	- ONC	
1987 1987		(1)	(2)	(6)	3	â	9	(2)	(8)	(6)	(00)	(11)	(12)
33-40 323-40 6 Jul 00.68 0 + 6.0275 + 0.056 334-50 15 Jul 05.10 + 5.10 + 118.625 + 4.948 + 6.027 + 6.0	·	GRAVITY GRAVITY WITTER (WAYER)	OBS. GRAVITY	Day	1	7 (6)	72	Ħ	ኊ	ĸ	: (5) = (5) = (7) =		565
334.40 339.40 6 Jul 06.68 0 + 6.0273 + 10.056 16.02		SALUES (CEALUS)	(crure)	Month	SJnou	(MGALS)		(Days)			(Valls)	(STALS)	(YOAL
334.50 15 Jul 106.10 + 5.10 + 118.8223 + 4.6.242 + 6.6.242		329.40	329.40	6 Jul	89.00	0	+	6.0275			+ 0.050		750-4
336.40 18.10 19.90 + 7.00 +18.829 +6.84 $338.16 21.10 10.23 + 8.05 +21.0973 +8.048 $ $338.25 21.10 10.680 + 9.15 +22.6573 +9.897 $ $338.25 22.10 10.680 + 9.15 +22.6573 +9.897 $ $338.25 22.10 10.680 + 9.15 +22.6573 +9.998 $ $338.25 22.10 10.680 + 9.15 +22.6573 +9.998 $ $339.24 22.10 10.89 +10.14 +22.1193 +10.18 +10.18 $ $342.20 22.10 10.89 +10.14 +22.1193 +12.697 +12.6$			334.50	15 Jul	06.10	• 5.10	+	15.2543			87677 +		750
337.45 21 Jul 02.33 + 8.05 + 121.0973 + 8.046 + 8.046 338.16 22 Jul 15.77 + 8.76 + 122.6573 + 8.876 338.26 24 Jul 16.68 + 9.89 + 124.6953 + 9.956 338.24 25 Jul 16.68 + 9.89 + 124.6953 + 9.956 338.24 25 Jul 16.68 + 9.89 + 124.6953 + 19.056 342.20 29 Jul 16.83 + 12.63 + 120.0673 + 112.659 342.20 29 Jul 18.83 + 12.63 + 120.0673 + 112.659 342.21 2 Jul 17.2 15.21 2 Jul 18.83 + 12.63 + 124.1963 342.27 2 Jul 17.2 15.21 2 Jul 18.83 + 12.65 342.71 3 Jul 16.80 + 17.39 + 134.1963 342.72 1 Jul 16.80 + 17.39 + 134.1963 342.72 1 Jul 16.80 + 17.39 + 134.1963 342.72 1 Jul 18.83 + 12.65 + 154.1963 342.72 1 Jul 18.83 + 12.65 342.72 1 Jul 18.83 1 Jul 18.83 1 Jul 18.83 342.72 1 Jul 18.83 1 Jul 18.83 1 Jul 18.83 1 Jul 18.83 342.83 1 Jul 18.83 1 Jul 18			336.40		19.90	7.00	+	18,8293			7 6 8/4		156
338.16			337.45		02.33	F 8.05	+	21.0973			+ 8.048		F.002
318.55			338,16		15.77	- 8.76	+	22,6573			+ 8.876		116
379.29 24, Jul 16.68 + 9.89 +24.6953 + 9.958 + 9.958 + 10.18 339.54 25 Jul 02.87 + 10.14 +25.1193 +10.183 342.16 29 Jul 16.62 + 12.65 +29.7842 +12.659 342.16 29 Jul 16.72 + 13.47 +31.6963 +13.673 342.87 31 Jul 16.72 + 13.47 +31.6963 +13.673 4.70 7 Aug 16.80 + 17.39 +38.7003 +17.390 5 = (EY)(EZ)-(EX)(EY) 13 + 129.65 +1541 + 421.1 + 4827 + 4827 + 487 5 = (EY)(EZ)-(EZ)-(EZ) 2 = -3.1479 2			338.55	23 Jul	06.80	. 9.15	+	23, 2833			4 9.209		+.059
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			339.29		16.68	68.6	+	24.6953			+ 9.958		*068
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			339.54			10.14	+	25,1193			+10.183		£7073
Since $\frac{342.16}{246.77} = 30.341 = 01.62 + 12.76 + 190.0673 + 112.809 + 112.809 + 113.673 + 11$				29 Jul		12.63	+	29.7843			+12.659		+.029
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			Ì	20 Jul		12.76	+	30.0673			+12.809		670-+
Since $\frac{344.71}{346.79} = \frac{3492}{16.87} = \frac{4.73}{16.80} = \frac{4.1963}{17.39} = \frac{4.1963}{4.87.003} = \frac{4.15.000}{1.77.39} = \frac{4.1963}{4.87.003} = \frac{4.15.000}{1.77.39} = \frac{4.1963}{1.77.39} = \frac{4.1963}{1.77.39} = \frac{4.1963}{1.77.39} = \frac{4.1963}{1.77.39} = \frac{4.1963}{1.77.39} = \frac{4.1963}{1.77.39} = \frac{4.17.390}{1.77.39} = \frac$			342.87	31 Jul	16.72 +	13.47	+	31.6963			+13.673		+.203
$\frac{4}{346.79} \frac{346.79}{7 \text{ Aug}} \frac{7}{16.80} \frac{10.89}{17.39} + \frac{138.7003}{818.7003} + \frac{117.390}{817.390} + \frac{117.390}{817.390}$ Substituting the street of the street			344.71	3.Aug	٠,	15.31	*	34.1963			415.000		310
Sins. Sins. Sins. Sins. Leg	,	*	346.79	į		17.39	+	38.7003		·	+17.390		800
Sinds					**************************************								
Sints							25.Z	ZZ.	2r2	Z Z			<u> </u>
$b = \frac{(EY)(EY^2) - (EYX)(EYX)}{(EY)^2(EY^2) - (EYX)^2} = -3.1479 \qquad \text{weals} \qquad \left[\text{ceal} = \frac{1}{(E)} + \frac{(EY)^2}{(E)^2} = +0.7704, \qquad \frac{(EY)^2}{(E)} \right] = \frac{24 \text{ Apr}}{24 \text{ Apr}}$ $a = \frac{(E)(EYX) - (EYX)(EYX)}{(E)(EYX) - (EYX)^2} = +0.5307 \qquad \text{weals} \qquad \left[\text{Fal} = \frac{1}{(EY)^2} + \frac{(EY)^2}{(EY)^2} = +0.001134, \qquad \frac{1}{(E)^2} \right]$ Stinnet $(E)(EYX) - (EYX)^2 = +0.5307 \qquad \text{weals} \qquad \left[\text{Fal} = \frac{1}{(EY)^2} - \frac{(EY)^2}{(EY)^2} = +0.001134, \qquad \frac{1}{(E)^3} \right]$ $(E)(EYX) - (EYX)^2 = \frac{1}{(E)^3} = \frac{1}{(EY)^2} - \frac{(EY)^2}{(EY)^2} = \frac{1}{(EY)^2} = $		SURS	·		+	-	+1541.	+321.		+3673.			+2.213
$b = \frac{(EY)(EYZ) - (EYZ) - (EYZ)^2}{(EY)(EYZ) - (EYZ)^2} = -3.1479 \qquad \text{equiv} \qquad \frac{(Ex)^2}{(EY)^2} + \frac{(EYZ)^2}{(EYZ)^2} = +0.7704 \qquad \text{DATE}$ $a = \frac{(EY)(EYZ) - (EYZ)^2}{(EY)^2} = +0.5307 \qquad \text{equiv} \qquad \frac{(Ex)^2}{(EYZ)} = \frac{1}{(EYZ)^2} + \frac{(EYZ)^2}{(EYZ)^2} = +0.001134 \qquad \frac{1}{gais} \qquad \text{DATE}$ $(E)(EYZ) - (EYZ)^2 - (EYZ)^2 = +0.5307 \qquad \text{equiv} \qquad \frac{1}{gais} \qquad \frac{1}{(EYZ)^2} = \frac{1}{(EY$	ii Ge	t d	•				64.87	1807		2288		೧ತಿರು	TED BY
$\mathbf{n} = \frac{(\mathbf{p})(\mathbf{p}/2) - (\mathbf{p}/2)^2}{(\mathbf{p})(\mathbf{p}/2) - (\mathbf{p}/2)^2} = +0.7704, \mathbf{DATE}$ $\mathbf{n} = \frac{(\mathbf{p})(\mathbf{p}/2) - (\mathbf{p}/2)}{(\mathbf{p})(\mathbf{p}/2) - (\mathbf{p}/2)^2} = +0.5307 \mathbf{grals}$ $\mathbf{gal} = \frac{1}{(\mathbf{p}/2)^2} - \frac{(\mathbf{p}/2)^2}{(\mathbf{p}/2)^2} = +0.001134, \frac{1}{\mathbf{gal}} = \frac{1}{(\mathbf{p}/2)^2}$ $\mathbf{part} = \frac{1}{(\mathbf{p}/2)^2} - \frac{1}{(\mathbf{p}/2)^2} = +0.001134, \frac{1}{\mathbf{gal}} = \frac{1}{(\mathbf{p}/2)^2} = \frac{1}{(\mathbf{p}/2)^2$	612 = 72 622 = 71) (ZEZ) (75 (15 (A) (25 (1)				· ·		(1		•	Zavie	828
$n = \frac{(2P)(2P_0R) - (2P_0R)(2P_1)}{(2P_0R)^2 - (2P_0R)^2} = \frac{24 \text{ Apr}}{40.5307} \frac{24 \text{ Apr}}{864} = \frac{1}{(2P_0R)^2} \frac{1}{(2P_0R)^2} \frac{1}{(2P_0R)^2} = \frac{24 \text{ Apr}}{40.001134} \frac{1}{864} = \frac{24 \text{ Apr}}{24 \text{ Apr}} \in \frac{1}{(2P_0R)^2}$)(P''Z)-(P'') ²	и	6277	elega.	·	+	A ·	- Ma	+0.7704	Ā	NTE
$n = \frac{(2P)(2P_0X) - (2P_0X)(2P_1)}{(2P_1)^2} = +0.5307$ $\frac{2P_0^{2}}{gal}$ $[Ph] = \frac{1}{(2P_0X)} - \frac{1}{(2P_0X)} = +0.001134$ $\frac{1}{gal} = \frac{1}{(2P_0X)}$	H -					٠,	·		•			77	
$n = \frac{(2P)(2P_0L) - (2P_0L)(2P_1L)}{(2P_0L) - (2P_0L)^2} = +0.5307$ $\frac{2P_0L}{2} = \frac{1}{(2P_0L)} - \frac{1}{(2P_0L)^2} = +0.001134$ $\frac{1}{2}$ $\frac{1}{2}$	5; = ±√[aa] =+.1223 =	gals										CHEC	KED BY
(P)(P(2)-(P(2))		il g	; •AX)-(XEX)(XEX) =	Ç.	2		ָר			• .			mette
	〒 ∠700°+- [dd] / ✓ + === 9		[<i>Pi</i> ?]-(<i>Pi</i>)2	2		3	4	(18.2) =	(<u>E</u>)	8 • `		L	or 63
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1331St Hg Apr 63 44 PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE

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	(3)	¥(2)	(3)	(7)	(5)	(9)	(4)	(8)	(6)	(01)	(n)	(21)	2
SUN VOITES	STANCARD	CBS. GRAVITI	Day	-	1	7.	14	۲,	X	£0(2) =	(.2) + (10)	(8-67)	<u>(S)</u>
***	(ALUES (MOALS)	(STEDA)	Month	Hours	(NG42.5)		(Days)			(3001.5)	(STYPE)	<u> </u>	(55,435)
Hickam AFB	325.16	325.16	1nf 9	00.68	0		6.0275			F 0.012		9	2.012
,		328.36	15 Jul	06.10	+ 3.20	,	15.2543			+ 3.088		- -	.112
		329.48	18 Jul	19.90	+ 4.32	,	18.8293			+ 4.288		9	.032
		330.21	21 Jul	02.33	+ 5.05		21,0973			4 5.050		p.0	000
		330.64	22 Jul	15.77	+ 5.48		22.6573			4 5.574		ŏ•q+	760
		330.86	23 Jul	06.80	+ 5.70		23, 2833			+ 5.785		O•q+	.085
		331.25	24 Jul	16.68	+ 6.09		24.6953			+ 6.259		7. 4	.169
		331.62	25 մոյ	02.87	4 6.46		25.1193			το 7°9 +		o-d-	.059
		333.22	29 Jul	18.83	\$ 8.06	-	29.7843			4 7.968		-p.o	.092
		333.21	30 Jul	01.62	\$ 8.05		30.0673			+ 8.063		0•q+	.013
		333.73	31 Jul	16.72	+ 8.57	-	31.6963			+ 8.610		-p.o.	070
		334.71	3 Aug	07.60	+ 9.55		34.1963			4 9.450)t.d-	100
→	->	336.13	7 Aug	16.82	+10.97		38.7003			+10.963		-D.007	6
				-								<u>'</u> 	
				ď	TE	2Pr2	Ä	22.42	PX			Ä	27.42
	SUMS			13	31.50	3	321.4081	8827.	2311.		4	+0.082097	46
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612 - 22								•			28.2	Zavi sze	
422 17	h = (EY)	(22 x²)-(22 x1) (22 x)		. 0	-			(WX)					
		(四)(四元)-(四元)	H	-2.0363			[cel]= (1) + (2)	$(\overline{x}x^2) - (1$	# 7 (X	+0.7704		DATE	
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7 = 12 (pp) = ±0.0029	# #	$\frac{(x)(xx)-(xx)(xy)}{(x)(xy)^2} =$		+0.3359		[बब]	[66] = (19.22) 1	<u>zha:</u>	Ŷ	+0.001134 1		DATE	T
p (gals			•				(a)			24 Apr	ipr 63	~~
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GRAVITY DIFFERENCE COMPARISON: LOOP VERSUS SINGLE DRIFT RATE INSTRUMENT 615

Station	Date & Hour	Days from First Obs	△G From Loop Comps	∆G From Single Drift	MCAL Differences
Pearl Harbor	6 Jul 61 01.60	0.0383	+4.80	+4.75	+0.05
Laysan Beach	10 Jul 61 20.95	4.8446	+369.08	+369.10	-0.02
Laysan Hiran	02.83	60896	+368.37	+368.45	-0.08
Lisianski Hiran	21.20	6.8550	+421.73	+421.82	-0.09
Lisianski Beach	21.55	6.8696	+422.80	+422.89	-0.09
Pearl Hermes Hiran	13 Jul 61 23.83	7.9646	+510.28	+510.4 0	-012
Midway . Gate 2	14 Jul 61 20.57	. 8 .8288	÷561.00	+561.14	-0.14
Midway Gate 2	19 Jul 61 03.08	13.1000	÷560.90	+561.00	-0.10
Kure Island	22.42	13.9058	+606.04	+606.21	-0.17
Midway Gate 2	20 Jul 61 04.52	14.1600	+560.96	+561.18	-0,22
Midway Old Ops	18.67	14.7496	+565.28	+565.34	-0.06
Midway Gate 2	18.83	14.7562	+560.96	+561.03	-0.07
Johnson Island	20.77	16.8371	-214.09	-214,17	-0.06
A.L.F. Bonham	24.Jul 61 18.80	18.7550	+120.90	+120.84	+0.06
French Frigate Shoals	21.88	18.8833	+246.16	+246.11	+0.05

Molokai Airport	29.Jul 61 20.00	23.8050	+25.77	+25.74	+0.03
Maui Kahului Airport	20.78	23.8375	-44.25	-44.28	÷0.03
Kamuela Airport	21.82	23.8808	-160,86	-160.89	+0:.03
Hilo General					
Lyman Field	22.53	23.9104	-58.38	-58.42	+0.04
Kamuela Airport	23.20	23.9383	-160.82	-160.86	+004
Maui Kahului Air po rt	30 Jul 61 00.00	23.9717	-44.27	- <u>4</u> 4.28	+0.01
Molokai Airport	00.67	23.9996	+25.71	±25.66	+0.05
Lihue Airport	31 Jul 61 20.08	25.8083	+103.94	+103.82	+0.12
K-1 Bridge	1 Aug 61 20.12	26.8100	+73.30	+73.17	+013
Kalahed U.S.G.S. BM700	21.13	26.8521	+43.,17	+43.06	· +0.11
Port Allen USGS					. 0. 00
BM "35"	22.17	26.8954	+70.85	+70.77	+0.08
Waimea USGS			.07.10		.0.05
вм ''9''	23.13	26.9354	+87.49	+87.44	+0.05
Bonham	23.98	26.9708	+120.98	+120.95	+0.03
Waimea USGS BM "9"	2 Aug 61 00.43	26.9896	+87.44	+87.42	+0.02

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Port Allen USGS BM "35"	01.20	27.0217	+70.81	+70,81	÷ 0 0.00
Kalahed USGS BM700	.01.57	.0371	+43.23	+43.24	-0.01
K-1 Bridge	01.87	.0496	÷73.42	+73.43	-0.01
Lihue Airport Gate 1	02.28	.0667	+104.06	+104.10	-0.04
W a ilu a Bridge	16.45	.6571	+127.41	+127.39	+0,02
Kapaa Armory	16.65	. 6654	+124.39	+124.38	+0.01
Kahal Point Light House	16.98	.6792	+116.29	+116.29	.+0.00
Koolau School	17.38	.6958	+110,56	+110.57	-0.01
Kilauea Tele. Ex69	17.65	.7071	+110.98	+110.99	-0.01
USGS BM17 Hanalei Bridge	18.05	,7238	+136.49	+136,52	-0.03
Wainiha BM101			.•		
Power House	18.52	.7435	+139.66	+139.70	-0.04
Kilauea Tele Exc.	19,55	.7863	+110.95	+111,01	06
Kapaa Armory	20.32	.8183	+124.38	+124.47	-0.09

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109
AC&W
Station 23.92 .9683 -166.07 -165.88 -0.19
Lihue 3 Aug 61
Airport 02.12 28.0600 +103.73 +103.97 -0.24

GRAVITY DIFFERENCE COMPARISON: LOOP VERSUS SINGLE DRIFT RATE INSTRUMENT 617

Station	Date and Hour	Days from First Obs	△G From Loop Comps	△G From Single Drift	MGAL Differences
Pearl Harbor Berth M-3	6 Jul 61 01.60	0.0383	+4.88	+4.87	+0.01
Laysan Island Top of Beach	20.95	4.8446	+369.11	+369.15	~O.04
Laysan Island Tri. Sta.	12 Jul 61 02.83	6.0896	+368.46	+368.52	-0.06
Lisiawski Is C&GS Sta	21.20	6.8550	+421.67	+421.74	-0.07
Lisiawski Is Top of Beach	21,33	6.8604	+422.86	+422.93	-0.07
South East Is Pearl	13 Jul 61				
Herms Midway USN Sta	23.83	7.9646	+510.25	+510.33	-0.08
Gate 2 at Term	14 Jul 61 20.57	8.8288	+560.91	+560.99	-0.08
Midway G a te 2	03.08	13.1000	+561.01	+561.00	-0.01
Kure Isl a nd	22.42	13.9058	+606.02	+606.02	-0.00

t	Midway Gate 2	20 Jul 61 04.52	14,1600	+561.04	+561.02	÷0.02
1	Midway Old Ops	18.67	. 14,7496	+565.37	+565.37	+0.00
	Midway Gate 2	18.83	14.7562	+561.03	+561,02	.+0.01
	Johnson Island	22 Jul 61 20.77	16.8371	-214.10	-214.20	+0.17
	A.F.L. Bonham	24 Jul 61 18.80	18.7550	+120.87	+120.73	+0.14
!	French Frigate Shoals	21.88	18.8883	÷246.01	.+245.93	+0.08
. (Molokai Airport	29 Jul 61 20.00	23,8050	+25.70	+25.75	-0.05
1	Maui Kahului	29 Jul 61	•••			
	Airport Kamuela	20.78	23,8375	-44.35	<u>44</u> .39	÷0.04
	Airport Hilo	21.82	23,8808	-160.47	-160.44	, -0.03
	General					
1	Lyman Field	22.53	23,9104	-58.45	-58.44	-0.01
	K amuela Airport	23.20	23.9383	-160.40	-160.40	-0.00
	Maui	00 - 1 (1				
j	K a hului Airport	30 Jul 61 00.00	23.9717	-44·27	~ 44 .28	+0.01
	Molokai Airport	. 00.67	23.9996	+25.76	+25.73	+0.03
) : !	Lihu e Airport	31 Jul 61 20.08	25.8083	+103,84	+103.81	+0.03
	K-l Br idge	1 Aug 61 20.12	26.8100	+7325	+73,20	+0.05

Kalahed USGS BM 700	+43.22	+43.22	0.00
K-1 Bridge	+73.32	+73.32	0.00
Lihue			
Airport			. 0. 03
Gate 1	+103.98	+103.95	+0.03
Wailua			
Bridge	+127.26	+127.29	-0.03
Kapaa			
Armory	+124.28	+124.30	-0.02
Kahal			
Point			
Light	.116 10	+116.19	-0.01
House	+116.18	7110,17	-0.01
Koolau			
Shoal	+110.42	+110.42	0.,0
Kileuea	₹		
Tele.			0.01
Exc.	+110.86	+110,87	-0.01
USGS BM17	¢		
Hanalei			
Bridge	+136.36	+136,36	0.00
Wainiha			
BM 101			
Power			حرم ندر
House	+139.62	+139.61	+0.01
Kamue la			
Tele.Exc.	+110.88	+110.85	+0.03
Kapaa			
Armory	+124.37	+124.33	+0.04
Kokee 109			
AC&W Sta	-165.74	-165.84	+0,10
Lihue			
Airport	+103.92	+103.78	+0.14

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Hanalei Bridge USGS RM "17"	18.05	.72 <u>3</u> 8	+136.23	+136.20	+0.03
Wainiha Power House BM 101	18.52	.7433	+139.56	+139.54	+0.02
Kilauea Tele. Exc.	19.55	.7863	+110.75	+110.74	+0.01
Kap a a Armory	20.32	.8183	+124.28	+124.27	+0.91
K okee 109 AC&W Sta	23.92	.9683	-165.02	165.59	-0,03
Lihue Airport	3 Aug 61 02.02	28.0600	*103.82	+103.87	0 , 0.5

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MEAN GRAVITY DIFFERENCE COMPARISON: LOOP VERSUS SINGLE DRIFT RATE

	MEAN SINGLE DRIFT△G FOR 615 & 617	MEAN LOOP △G FOR 615 & 617	MGAL DI FFERENCES
Hickam MATS	0.00	0.00	0.00
Pearl Harbor	+4.81	+4.84	0.03
Laysan Beach	+369.12	+369.10	÷0.02
Laysan Hiran	+368.48	÷368.42	+0.06
Lisi a nski Hiran	+42178	+421.70	+0.08
Lisianski Beach	+422.91	+422.83	+0.08
Pearl Hermes Hiran	+510.36	+510.26	+0.10
Midway Gate 2	+561.06	÷560.96	÷0.10
Midway Gate 2	+561.00	+560.96	÷0.04
Kure Island	+606.12	+606.03	÷0,69
Lifway Gate 2	+561.10	*561,00	+0,10
Midway Old Ops	+565.36	+565.32	+0.04
Midway Gate 2	+561.02	+561.00	+0.02
.Johnson Island	-214.17	-214.10	-0.07
A.F.L. Bonham	+120.78	+120.88	0.10
French Frigate Shoals	+246.02	+246.08	-0.06

Molokai Airport	+25.74	+25,74	0.00
Maui Kahului Airport	- 1 14.34	-44.30	-0.04
Kamuela Airport	-160.66	-160.66	.0.00
Hilo General Lyman			
Field	-58.43	-58.42	-O ₀ 01
K am uel a Airport	-160.63	-160.61	-0-02
Maui Kahului			
Airport	-44.26	-44.23	-0.03
Molukai			
Airport	+25.70	+25.74	-0, 04
Lihue Airport	+103.82	+103.89	-0.07
K-1 Bridge	-72.18	+73.28	-0.10
Kalahed USGS BM''700''	+43.10	+43.17	- 0.07
Port			
Allen USGS BM	35 +70.69	+70.74	-0.05
Waimea USGS BM	9 +87.26	+87.28	-0.02
Bonham	+120.89	+120.91	-0.02
Waimea USGS BM	9 +87.26	+87.28	-0.02
Port Allen USGS BM	35 +70.70	+70.70	000

Kalahed	1 Aug 61				
BM "700"	21.13	26,8521	+43.17	+43.13	+0.04
					-
Port					
Allen					
USGS					
BM''35''	22.17	26.8954	+70.64	+70.61	+0.03
Waimea					
USGS ''9''	23.13	26,9354	+87.08	+87.06	+0.02
0000	20,10	20,7034	, 0, , 00	,07.40	70,02
Bonham	23.98	26.9708	+120.84	+120.83	+0.01
, *********					
Waimea USGS	2. 4 61	26 0006	.07.11	.07.10	
BM ''9''	2 Aug 61 00.43	26.9896	+87.11	/ 87.10	+0.01
BM 3	.00,43				
Port					
Allen					
USGS			•		
BM "35"	01.20	27.0217	+70,59	÷70.59	-0.00
Kalahed					
USGS					
BM 700	01.57	.0371	+43.20	+43.21	-0.01
Bei 700	01.37	.4371	743,20	743.21	-0.01
K-1					
Bri dge	01.87	. 0496	<i>‡</i> 73,22	+73.22	-0,00
Lihue					
Adrport					•
Gate 1	02.28	. 0667	+103.84	+103.85	-0.01
oute 1	O2.4,2 O	,0007	7,200,07	÷105'' 62	-0,01
Wailua					
Bridge	16.45	.6571	+127.17	+127.13	+0.04
Vanaa					
Kapaa	16.65	EERI	104 91	.106 17	. 0. 04
Armory	40.00	. 6654	+124.21	+124.17	+0.04
Kahal					
Point					
Light					
House	16.98	. 6792	+116.09	+116.06	+0.03
TP 4					
Koolau	17 20	<i>2</i> 020			
Shoal	17.38	. 6958	+110.29	+110,25	+0.04
Kilauea					
Tele.					
Exc.	17.65	.7071	+110.76	+110.73	+0.03
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LOOP COMPUTATIONS

				3	GRAVITY LOOP COMPUTATIONS	P COMPUTA	TIONS					
				MEAN	DIAL	MEAN	Š	CORRECTIONS TO	9	CORR		in the state of th
STATION	DATE	A TIME	COUNTER	OIAL O. U.	FACTOR MGALS/D.U.	DIAL	MEA	N DIAL, MG	3	DIAL	COUNTER	∆.G. MGALS
Hickam MATS Term.	6Ju161 0041	55	7	73.33	76569*	51.03	01			51,02	278.38	0.00
Pearl Harbor	0136	55	7	80.23	76569*	55.84	00.0		02	55.82	278.38	44.80
Pearl Harbor	1710-	5987	7	80.56	76569*	56.06	+.09	31 31			278.38	
Laysan Beach	10Ju161 2057	6042	10	07.26	76569°	50*50	+.13	31	-2.30	02,54	695.94	+369.08
נ	12Ju161 0233	17	10	08.40	76569*	58*50	7.04	71			695.94	;
Laysan Hiran	0250	6059 1102	10	67-79	76569*	41° 50.	+.02	-1.02	-2.34	01.83	76.369	+368.37
Lisianski Hiran	2112	7161	JO.	64.60	76569	58.88	+.09	-1.02	-2.76	55.19	695.94	+421.73
Lisianski Beach	2133	7182	10	86.13	76569.	76.65	+.11	-1.02	-2.77	56.26	695.94	+422.80
Pearl & Hermes Hiran	13Ju161 2350	8759	12	12.63	76569*	08.79	+.16	-1.02	-3.38	04.55	835.13	+510.28
Midway Gate 2	14Ju161 2034	10003	12	97.98	.69594	60.17	02	-1.02	-3.86	55.27	835.13	561.00
Hickam MATS Term.	15Jul61 0606	10575	7 -	80.76	76695	56.20	90	-1.02	80.7-	51.02	278.38	0.00
	•										•	
												
1. EARTH TIDE 2. DRIFT BETWEEN TRIPS	DE FWEEN TRIPS			· ·	osser Lt	observer Lt. Schweninger	inger		сомритер ву Дауі	reo av Davis	DA 21	DATE 21 Mar 63
S. DRIFT DUR	DRIFT DURING TRIPS				TINST	INSTRUMENT #615	15		снескер ву Stil	ser Stinnette		

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				당	SRAVITY LOOP COMPUTATIONS	P COMPUTA	TIONS	•	,			
STATION	DATE	A TIME	COUNTER	MEAN	DIAL	MEAN	COR	CORRECTIONS TO MEAN DIAL, MGALS	TO SALS	CORR	COUNTER	Δ6.
	TIME	MIN.		D. U.	MGALS/0.U.	MGALS	1	2		MGALS	MGALS	MGALS
Hickem AFB MATS Term	6Ju161 0041	755	7	68.47	.6938	47.50	01			47.49	277.67	
Pearl Harbor Berth-M-3	0136	155	7	75.50	\$669.	52.38	+.00		01	52.37	277.67	+ 4.88
Pearl Harbor Berth-M-3	1710.	2987	7	75.70	. 6938	52.52	+.09	- <u>.23</u> / - <u>.23</u> /		52.37	277.67	
Layson Is. Top of Beach	10Ju161. 2057	5042	10	02.57	°, 6950	1.79	+.13	23	-1.45	0.24	694.03	+369.11
Is. Beach	12Ju161 0233	17 /	10	03.34	0569*	2.32	+.04	 	,	72.0	694.03	
Layson Is. Tri. Sta.	0520	1102	10	02.43	. 6950	1.69	+.02	67	-1.45	- 9.41	694.03	+368.46
Lisiawski Is. C & GS Sta.	2112	7161	10	79.27	0569°	60*55	60*+	67	-1.71	52.80	60.469	+421.67
Lisiawski Is. Top of Beach	2133	77182	10	80.97	.6950	56.27	+,11	<i>-</i> .67	-1.72	53.99	60.169	+422.86
Southeast Is. Pearl & Herms	13Jul61 2350	1244	. 12	07.27	7.6937	5.04	+.16	-÷67	-2.10	2.43	832.98	+5,10,25
Midway USN Sta Gate #2 at Ter		/10003 572	12	80.97	.6937	56.17	02	67	-2.39	63.06	832.98	+560.91
Hickam AFB MATS Term	151n161 0606	10575	7	73.17	\$669*	50:77	08	67	-2.53	47.49	277.67	,
				,							, .	
·	•	ŀ		,								
										·		
1. EARTH TIDE 2. DRIFT BETW	EARTH TIDE DRIFT BETWEEN TRIDE				3860	OBSERVER J.B.S.			сомечтер вү Катызеу	uted by Ramsey	DATE 24 Ju	re Jul 61
3. DRIFT OU	DRIFT DURING TRIPS	·			Trini	INSTRUMENT #617	17		CHECKE Sti	CHECKED BY Stinnette	27.	24 Jul 61

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-				25	WITY LOO	GRAYITY LOOP COMPUTATIONS	SNOIT					
STATION	DATE	A TIME COUNTER	COUNTE	MEAN	DIAL	MEAN	COM	CORRECTIONS TO	5 TO	CORR	COUNTER	
	TIME	MIN.		g. u.	MGALS/D.U.	MGALS	-	2		MGALS	MGALS	MGALS
Hickam AFB	18Jul61 1954	7167		07.687	76569.	346.42	02			386.40		
Midway Gate 2	19Jülél 0305	7,31		1289.36		897.32	+ .08		10	897.30		+560.90
Midway Gate 2	2058	87		1290.17		897.88	00.	87:-				,
Kure Island	2225	518		1355.07		943.05	01	87	12	942.44		70*909+
Kure Island	20Ju161 0341	50		1355.23	,	943.16	+.05	$\frac{-17}{65}$				
Midway Gate 2	0431	568		1290.47		60*868	+.05	65	£1:-	897.36		+560.96
Midway Gate 2	1829	11		1290.67		898.23	+.07	-15				
Midway Old Ops	1840	10 / 01		1296.90		902.56	+ .06	81	13	997.06		+565.28
Midway Gate 2	1850	589		1290.70		898.25	+ .06	81	77.	897.36		+560.96
Hickam AFB	21Ju161 0220	1039		£8.787	,	337.41	÷.04	-,81.	77.	336.40		
n to age of the					•	·		•		,		
										,	, .	
												,
1. EARTH TIDE	EARTH TIDE DRIFT BETWEEN TRIPS				OBSERVER	iver A2C Meyn	eyn		COMPUTED BY	ureo ex Stinnette	DATE 4 A	ATE 4 Aug 61
S. DRIFT OUR	DRIFT DURING TRIPS				INSTR	INSTRUMENT #615	2	٠	снескер ву W.H.R.	o ay [. R.	7	DATE 4 Aug 61

				25	GRAVITY LOOP COMPUTATIONS	COMPUTA	TIONS	,				,
MOLEVE	DATE	- N	COUNTER	MEAN	PACTOR	MEAN	COR	CORRECTIONS TO MEAN DIAL, MGALS	TO	CORR	COUNTER	' ⊘
	TIME			D, U.	MGALS/D.U.	MGALS	-	2		MGALS	MGALS	MGALS
Hickam AFB	18Jul61 1954	167	7	74.70	8669.	51.83	-•05			51.81	277.67	
Midway Gate 2	19Jul61 0305	431	21	82.90	7669.	57.51	+.08		08	57.51	832.98	+561.01
Midway Gate 2	2058	87	12	83.40	.6937	57.85	8	26		,		,
Kure Island	2225	518	13	48.37	6269*	33.52	01	26	10	33.15	902.35	+606.02
Kure Island	20Jul61 0341	82	52	48.37	6269	33.52	+.05	06 32			`	
Midway Gate 2	0431	268	27	83.50	6937	57.92	+.05	35	11	57.54	832.98	+561.04
Midway Gate 2	1829	11	12	83.77	.6937	58.11	4.07	12:-/		,		
Midway Old Op	0p81840	10 / 01	12	90,03	.6937	62.45	90° +	53	1.	61.87	832.98	+565.37
Midway Gate 2	1850	<u>/ 589</u>	77	83.77	.6937	58,11	90*+	53	-,11	57.53	832.98	+561.03
Ficken AFB	21Ju161 0220	1039	7	75.67	.6938	52.50	+.04	53	-,20	51.81	2777.67	
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		-										
	0.6				:088E	observer 1/Lt Schi	Schweninger	Ĥ	COMPU	COMPUTED BY Stinnette		DATE 3 Aug 61
3. DRIFT DU	DRIFT DURING TRIPS				INSTA	INSTRUMENT #617	17		CHECKED BY W.H.R.	ß. R.	YQ	DATE 4 Aug 61
			ŀ									

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	,			28	GRAYITY LOOP COMPUTATIONS	P COMPUTA	TTONS					
STATION	DATE	Δ Timë	COUNTER	MEAN	DIAL	MEAN	COR	CORRECTIONS TO MEAN DIAL, MGALS	TO SALS	CORR	COUNTER	Δ 6.
	TIME			D, U.	MGALS/D.U.	MGALS		2	-	MGALS	MGALS	MGALS
Hickem AFB	22Ju161 1546	1005		485.83	.69594	388.11	+.05			338.16		
Johnson Is.	2046	355	·	178.33		124.11 +.11	+.11		15	124.07		-214.09
Johnson Is.	23Jul61 0128	320 /		178.63		124.32	- 03	10:-0			, 	
Hickam AFB	8790	620		07.987		338.51	70*+	07	-32.	338.16		
					,					1 2		
										,		
Hickem AFB	24,Ju161 164,1	127		487.50	.69594	339.27	+.02			339.29		
A.L.F.Bonham	1878	127.		661.13		11.097	+.13		05	61.097		+120.90
French Frigate SHOALS	2153	312		841.20		585.42	+.16		.13	585.45	·	+246.16
Hickem AFB	25Jul61 0252			00.887		339.62	F. 08		.25	339.29		
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·	 -			,								
		dillilli			·							
1. EARTH TIDE 2. ORIFT BETWEEN TRIPS	DE TWEEN TRIPS	,		,	OBSERVER	IVER A2C Meyn	fey n		COMPUTED BY Stinne	uteo av Stinnette	DATE 4 A	Are 4 Aug 61
3. DRIFT DU	DRIFT DURING TRIPS				INSTR.	INSTRUMENT #	#615		снескер ву И.Н.	ED BY W.H.R.	DATE 4 A	A Aug 61

-				સુ	GRAVITY LOOP COMPUTATIONS	P COMPUTA	TIONS					
STATION	DATE	A TIME COUNTER	COUNTER	MEAN	DIAL	MEAN	COR	CORRECTIONS TO	5 To	CORR		\ \ \ \ \ \
	TIME	MIN.	·	ה ה ה	MGALS/0.U.	MGALS	-	2	•	MGALS	MGALS	MGALS
Hicken AFB	22Jul61 1546	My r	7	76.27	8669°	25°25	\$0°÷			52.97	277.67	**
Johnson Is.	5076	300	Н	67.83	.6943	60°47	+.11		00.0	47.20	76.69	-214.10
Johnson Is.	23Ju161 0128		1	68.33	.6943	77-67	03	2.				
Hickam AFB	9790	920	7	76.60	. 8693	53.15	70°+	21	01	52.97	277.67	
·												
				·	·		,					
Hickem AFB	24Jul61 1641	127	7	77.20	3669.	53.56	+.02			53.58	277.67	
A.L.F.Bonhem	1848	127	9	51.43	7669.	35.66	+.13		.08	35.71	416.41	+120.87
French Frigate SHOALS	2153	312	₩	31.93	.6943	22.17	+.16	·	19	22.14	555:12	+226.01
Hickam AFB	25Jul61 0252		7	77.87	.6938	54.03	08		37	53.58	277.67	
							·					
	-											
1. EARTH TIDE 2. ORIFT BETW	EARTH TIDE DRIFT BETWEEN TRIPS				OBSE	osserver 1/Lt Schweniger	hvenig	er	COMPUTED BY Stinner	Puter BY Stinnette	DATE 3 AU	re Aug 61
3. DRIFT DU	DRIFT DURING TRIPS				INSTR	INSTRUMENT #617			снескер ву И.Н. R.	5 8Y 1. R.	7 7	DATE 4 Aug 61

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				3	GRAVITY LOOP COMPUTATIONS	COMPUTA	TIONS						
			-	XEAX	DIAL	MEAN	CORR	ECTIONS	٩	CORR			_
STATION	DATE	A TIME	COUNTER	o. c.	FACTOR MGALS/D.U.	DIAL	MEAN	MEAN DIAL, MGALS	ALS 3	DIAL	COUNTER	Δ G. MGALS	
Hickam AFB	29Ju161 1850	2		491.57	0.69594	342.10	07			342.03			·
Molokai Airport	2000	2 27		528.53	0.69594	367.83	01		02	367.80		+25.77	1
Maui Kahului Airport	2047.	117		427.87	0.69594	297.77	+,05		70.	297.78	,	-44.25	
Kamuela Airport	2176	179		260.23	0.69594	181.10	£.13		90.	181.17	·	-160.86	
Hilo General Lyman Field	2232	40 /		701.43	0.69594	283.55	+.17		. 20*	283.65		-58.38	
Kamuela Airport	2312	7,262		260,23	0.69594	181.10	+.19		.08	181.21		-160.82	· 1
Maui Kahului Airport	0000	2310		427.82	0,69594	297.74	1.20		-, 10	297.84		44.19	
Molokai Airport	30Jul61 0000	350		528.30	0.69594	367.67	+.18		7	367.74		+25.71	
Hickem AFB	7510	407		491.43	0.69594	342.01	+.15		.13	342.03			
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												•	
													, 1
1. EARTH TIDE					OBSE	OBSERVER A2C Meyn	E.		COMPUTED BY Stinnet	Pureo av Stinnette	,	DATE 15 AUE 61	
A DAIT DE	A. DRIFT DURING TRIPS	.			INSTR	INSTRUMENT #6	#615	,	CHECKE	снескер ву Ramsey		DATE 15 Aug 61	
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		•		. GR.	GRAVITY LOOP COMPUTATIONS	COMPUTA	LTIONS				•	
		,	24.7110	MEAN	DIAL	MEAN	COR	CORRECTIONS TO MEAN DIAL, MGALS	5.5 2.5 2.5	CORR	COUNTER	₽6.
	TIME	4		o. u.	MSALS/D.U.	MGALS	-	7	-	MGALS	MGALS	MGALS
Hickem AFB	29Ju161 1850		. 7	80.17	8669.	55.62	07			55.55	277.67	
Molokai Airport	2000	02.	5	17.13	9669°	11.88	01		0.00	11.87	347.05	+25.70
Mauí Kahului Airport	2047	117	7	16.07	.6938	11.15	+.05	_ 3d	00.0	11.20	277.67	-44.35
Kamuela Airport	5173	43 73	23	64.87	9769.	33.85	+.13		00.0	33.98	138.77	-160.47
Hilo General Lyman Field	2232	7227	2	95.57	7769.	96.36	+.17		+.01	66.54	208.23	-58.45
Kamuela Airport	2312	7,87	~	. 62.87	9769*	.33*82.	+.19	F	+.01	34.05	138.77	-160.40
Maui Kahului Airport	0000		7	15.95	.6938	10°τι	+.20		+.01	11.28	277.67	-44.27
Molokai Airport	30Jul61 0040	70	5	16.93	9669.	11.74	+.18		+.01	11.93	347.05	+25.76
Hickem AFB	0137	407.	7	79.83	.6938	. 55.39	ŕ.15		+•01	55.55	277.67	
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			1						,			
				,	·							
	**-											
1. EARTH TIDE 2. DRIFT BETW	EARTH TIDE DRIFT BETYEEN TRIPS				OBSERVER 1/I	nver 1/Lt Schweninger	wening	er	COMPUTED BY			o an
3. DRIFT DU	DRIFT DURING TRIPS				ATSK)	NSTRUMENT	#617		CHECKED BY	osy Ramsey		PATE 15 Aug 61
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		-		25	VVITY LOO	GRAVITY LOOP COMPUTATIONS	SHOIT				· ,		
MOITATA			1	MKAN	DIAL	MEAN	000	CORRECTIONS TO	S TO	CORR			т
	TIME			0. u.	MGALS/D.U.	MGALS	-	2	-	DIAL.	COUNTER	MGALS	
Hickam AFB	31Ju161 1643	M $pprox$		492.67	. 69594	342.87	0.00			342.87			5
Lihue Airport	2005	202		642.33	.69594	77.05	05		16	18.977		+103.94	Т.
Lihue Airport	lAug61 1714	173		642.73	.69594	447.30	+.04	37					Т
K-1 Bridge	2007	375		99.00	.69594	416.87	03	37	30	416.17		+ 73.30	T
Kalahed U.S.G.S.BM700	2108	436		555.77	.69594	386.78	02	37	35	386.04		+ 43.17	T
Port Allen US GS BM"35"	2210	867		595.60	76569*	77.50	10.	37.	40	413.72		+ 70.85	,
Waimea USGS BM"9"	2308	556 51		619.53	,6959k	731.16	+.02	37	45	430.36		+ 87.49	1
Bonham	2359	607		79.799	.69594	99.797	+.05	37	67	763.85		+120.98	т
Waimea USGS BM "9"	2Aug61 0026	63 4 46		619.50	.69594	431.13	90°+	37	-,51	16.067		+ 87.44	Т
Port Allen USGS BM "35"	0112	wo ι		595.63	.6959%	414.52	÷.08	-,37	55	413.68	٠.	+ 70.81	
Kalahed USGS BM 700	0134	705 -1 8		556.03	.69594	386.96	±.08	37	57	386.10		+ 43.23	+
K-l Bridge	0152	25		299.40	76569*	417.15	+.09	37	58	416.29		+ 73.42	
Lihue Airport Gate l	0217	745		643.47	76569.	447.82	+.09	37	61	446.93		+104.06	
Lihue Airport Gate l	1605			643.83	.69594	448.07	+.09	25					7
1. EARTH TIDE 2. DRIFT BETW	EARTH TIDE 'DRIFT BETWEEN TRIPS				OBSERVER	aver A2C Meyn	eyn		COMPUTED BY	uren av Stinnette		DATE 15 Aug 61	1
3. DRIFT DUR	DRIFT DURING TRIPS				RTSNI	INSTRUMENT #615	2		СИЕСКЕВ ВУ	osy Remsey	۵		

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,		,		33	GRAVITY LOOP COMPUTATIONS	P COMPUTA	LTIONS			-			
STATION	DATE	A TIME	COUNTER	MEAN	DIAL	MEAN	COR	CORRECTIONS TO MEAN DIAL, MGALS	1 TO	COAR	COUNTER	Δ α.	T
	TIME			D. U.	MGALS/D.U.	MGALS		2	3	MGALS	MGALS	MGALS	
Hickam AFB	702 E791	202	7	80.80	. 6938	90°95	00.0			56.06	277.67	-	·
Lihue Airport	5002	33	9	30.70	7669.	21.29	05		80*-	21.16	17'917	+103.84	
Lihue Airport	1Aug. 61 1714	173	9	30.93	. 7669*	21.45	+.04	125/			416.41		
K-1 Bridge	2002	61 375	5	87.03	9669.	96.09	03	25	15	59.93	347.05	+ 73.25	
Kalahed USGS BM "700"	2108	62 135	5	43.67	9669.	30.29	02	25	17	29.85	347.05	+ 43.17	<u> </u>
Port Allen USGS BM "35"	2210	28 7 85	5	83.30	9669*	57.78	01	-,25.	20	57.32	347.05	+ 70.64	·
Waimea USGS BM "9"	2308	52 /25	9	00.70	.6934	4.85	+.02	25	22	4.40	17.917	+ 87.08	
Bonham	2359	½ ½	9	55.67	.6934	38.60	+.05	. 25	24	38.16	17.917	+120.84	
Waimea USGS BM 11911	2Aug61 0026	16 632	9	07.03	.6934	04.87	·90·+	25	25	4.43	17.917	+ 87.11	
Port Allen USGS BM "35"	0112	8 2	5	83.20	.6936	57.71	+ .08	- 52-	27	57.27	347.05	+ 70.59	
Kalaheo USGS BM "700"	0134	792	- 5	43.73	.6936	30.33	+.08	25	28	29.88	347.05	+ 43.20	
K-1 Bridge	0152	25 /28	5	87.00	.6936	76.09	£.09	25	-,28	59.90	347.05	+ 73.22	
Lihue Airport Bate 1	0217	745	9	31.17	.6934	21.61	÷.09	.25	-,29	21.16	416.41	+103.84	
Lihue Airport Gate l	1605		9	31.37	. 6934	21.75	09	<u> </u>			17.917		
1. EARTH TIDE 2. ORIFT BETW	EARTH TIDE 'DRIFT BETWEEN TRIPS				. 083	OBSERVER 1/Lt	1/Lt Schweninger	Inger	COMPUTED BY	Puter BY Stinnette		DATE 15 Aug 61	
3. DRIFT DU	DRIFT DURING TRIPS				T INST	INSTRUMENT #617	<i>-</i> -		CHECKED BY	Bamsey		DATE 15 Aug 61	
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				25	WITY LOO	GRAVITY LOOP COMPUTATIONS	LTIONS					
STATION	DATE	A TIME	COUNTER	MEAN	BIAL	MEAN	CORI	CORRECTIONS TO WEAN DIAL, MGALS	5 TO	CORR	COUNTER	Δ 6.
	TIME	MIX.		D. U.	MGALS/D.U.	MGALS	1	7	3	MGALS	MGALS	MGALS
Lihue Airport Gate l	2Aug61 1605	22	•							ī		•
Wailua Bridge	1627	767		07.776	.69594	471.43	+.09	62	62	470.28		+127.41
Kapaa Armory	1639	20		673.07	76569.	77.897	60*+	62	63	467.26	,	+124.39
Kahal Point Light House	1659	799		661.47	.69594	76°097	60*+	62	65	459.16		+116.29
Koolau School	1723	823 16		653.27	76569.	79.757	¥°.08	62	67	723.43		+110.56
Kilauea Tele. Exc.	1739	839		653.90	76569*	755.08	+.07	62	89	453.85		+110.98
USGS BM 17 Hanalei Bridge	1803	863		690.60	,69594	480.62	90°+	62	70	479,36		+136.49
Wainiha BM 101 Power House	1831	891		695.20	.6959%	783.85	+.05	62	72	482.53		+139.66
Kilauea Tele. Exc.	1933	953	,	654.07	76369.	455.19	+,02	62	77	453.82		+110.95
Kapaa Armory	2019	216		673.43	.69594	79.897	+.01	62.	81	467.25	,	+124.38
Kokee 109 AC&W Station	2355	1215		256.33	.69594	178.39	+.02	62	66	176.80		-166.07
Lihue Airport	3 4ug61 0207	1347		644.10	.69594	448.25	+.06	62	-1.09	446.60		+103.73
Hickam AFB	0442	1502		495.25	76569.	344.66	+.05	62	-1.22	. 342.87		
,												
1. EARTH TIDE 2. DRIFT BETW	EARTH TIDE DRIFT BETWEEN TRIPS				OBSERVER]	A2C Meyn		COMPUTED BY Stinn	ures av Stinnette	DATE 15	15 Aug 61
3. DRIFT DUR	DRIFT DURING TRIPS			••	RTSNI	INSTRUMENT #	#615		CHECKED BY	ED 8Y Ramsev	DATE	15 Aug 61
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				3	GRAVITY LOOP COMPUTATIONS	P COMPUT	ATIONS					
STATION	DATE	A TIME	COUNTE	MEAN DIAL O. U.	DIAL FACTOR MGALS/D.U.	MEAN DIAL MGALS	COM	MEAN DIAL, MGALS	SALS	CORR	COUNTER	Δ α.
Lihue Airport Gate l	2Aug61 1605	22			769.			39			416.41	
Wailua Bridge	1627	12/67	9	65.03	7693	45.09	+.09	39	30	67.77	17.917	+127.17
	1639	20,773	9	60.77	.6934	42.14	+.09	39	31	41.53	17.917	+124.21
Kahal Point Light House	1659	72	9	49.07	.693	34.03	+.09	-,39	32	33.41	17.917	+116.09
Koolau School	2Aug61 1723	16 823	9	40.73	7669.	78.24	*.08	39	32	27,61	17.917	+110.29
Kilauea Tele, Exc.	1739	839	9	. 67.17	. 6934	28.73	+.07	39	33	28.08	17.917	+110.76
Hanalei Bridge USGS BM "17"	1803	% % %	9	78.20	7699.	27.22	9 0°+	39	34	53.55	416.41	+136.23
Wainiha Power House BM 101	1831	291	9	83.03	7669.	57.57	+.05	39	35	56.88	17.917	+139.56
Kilauea Tele. Exc.	1933	6 953	9	41.57	7669.	28.82	+.02	39	38	28.07	416.41	+110.75
Kapaa Armory	2019	21	9	61.10	.6934	42.37	+.01	39	39	41.60	416.41	+124.28
Kokee 109 AC&W Station	2355	132	(V	73.67	9769:	30.19	+.02	39	87	29.34	138.77	-165.62
Lihue Airport	3Aug61. 0207	1347	9	31.73	.6934	22.00	+ .06	39	53	21.12	17:917	+103.82
Hickam AFB	9670	%77.	7	82.14	.6938	56.99	+.05	39	59	56.06	277.67	
		İ										
1. EARTH TIDE 2. DRIFT BETW	EARTH TIDE DRIFT BETWEEN TRIPS				08567	osserver 1/Lt Schu	Schweninger	Ę,	COMPUTED BY	TED BY Stinnette	DATE 15	re 15 Aug 61
3. DRIFT DUR	DRIFT DURING TRIPS	: !			INSTR	INSTRUMENT #617	17		CHECKED BY		Ramsev	15 Au
1004 FOCT												9

				25	GRAVITY LOOP COMPUTATIONS	P COMPUTA	TIONS					
STATION	DATE		COUNTER	MEAN	DIAL	MEAN	COR	CORRECTIONS TO MEAN DIAL, MGALS	TO ALS	CORR	COUNTER	Δ σ.
•	TIME	ž		o. c	MGALS/D.U.	MGALS .	-	2	3	MGALS	MGALS	MGALS
Hickem MATS Term	7Aug61 1648	301		498.28	76569*	346.77	+.02			346.79		,
Molokai Airport	1834	106		535.23	76569	372.49	+,10		70*-	372.55		+ 25.76
Molokai Airport	15Aug61 0238	73		1610.63	76569.	1120.90	+.07	8687L -74838				
Hickam MATS Term	0351	7779		1573.73	76569*	1095.22	+.02	86874	07	61.978		
			en innerene	-								#617
Hicksm MATS Term	7Aug61 1649	105	7	87.23	8669°	58.44	+.02			97.85	19.772	
Molokai Airport	1834	193	5	21.40	,6936	78.77	+,10		01	66°71	30.7%	+ 25.85
Molokaí Airport	0238	73	16	10.83	.6933	07.51	+.07	+7.36 +7.36				
Hickam MATS Term	0351	1778	15	73.77	.6927	51.10	+.02	+7.36	02	58.46	10,0189	
·					·.							
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1. EARTH TIDE	DE				OBSE	OBSERVER A2C	A2C Mevn		COMPUTED BY	Stinnette		DATE 30 Aug 61
3. DRIFT DURING TRIPS	3. DRIFT DURING TRIPS	_			ILSNI ILSNI	INSTRUMENT& 617	7		СНЕСКЕ	сиескер ву Radtke		Aug

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	,			G.S.	GRAVITY LOOP COMPUTATIONS	P COMPUTA	TIONS					
				MEAN	DIAL	MEAN	COR	CORRECTIONS TO	T0	CORR		
STATION	DATE	A TIME	COUNTER	9 <u>9</u>	FACTOR MGALS/D.U.	DIAL	. KEA	2 AG	JALS 3	DIAL	COUNTER	∆ G. Mgals
	8Aug61 1806	31		536.17	76569.	373.14	+.04			373.18		
Kualapuu USGS BM 878	1837	12/2		474.13	.69594	329.97	+.07		02	330.02		-43.16
Kalaupapa Lookout	1850	3 4		382.30	76569.	266.06	+°08		02	266.12		-107.06
Molokai Airport	1921	175		536.13	76569.	373.11	+.11		70	373.18		
					·	,						
Molokai Airport	SAugol 1 8 06	31	2	21.93	9669.	15.24	70.+			15.28	347.05	
Kualapuu USGS BM 878	1837	13 /1	7	59.70	3669	71.42	+.07		+.03	71:55	277.67	-43.14
Kalauvapa Lookout	1850	37 44	. 3	67.80	7769.	47.08	+°08		+.04	47.20	208.23	-106,90
Molokai Airport	1921	75	5	21.77	9669.	15.10	+.11		+.07	15.28	347.05	
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·					·							
	·											
1. EARTH TIDE	EARTH TIDE				OBSE	observer A2C Lt Schw	AZC Meyn 615 Schweninger	15 r 617	COMPUTED BY		Stinnette	70 Aug 61
3. DRIFT DUR	DRIFT DURING TRIPS	,			NSTR.	INSTRUMENT #615 &	#617		CHECKED BY Rad	tke	DATE	31

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				GR	GRAVITY LOOP COMPUTATIONS	COMPUTA	TIONS					
3				HEAN	DIAL	MEAN	CORR	CORRECTIONS TO	To ALS	CORR	COUNTER	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
NOTATE	TIME		N 200	0 G	MGALS/D.U.	MGALS	-	7	-	MGALS	MGALS	MGALS
Molokai Airport	8Aug61 1921	25		536.13	.69594	373.11	+.11			373.22		,
Kaunakakai USGS BM	1926	29 / 25		535.20	.69594	372.47	+.13		02	372.58		79*0-
Hwy 45 Bridge	2015-	21 24		522.87	76569*	363.89	77.7		05	363.98		72.6-
Kamalo USGS BM 39	2036	23 / 75		521.97	76569.	363.26	+.15		-,07	363.34		-9.88
Pukoo Fish Pond	2059	31 88		527.00	76569.	366.76	+.16		-,10	366.82		-46.40
Kanaha Point USGS BM 48	2130	129		530.33	76569:	369.08	+.16		13	369.11		-4.11
Halawa USGS .BM 25	2210	169		541.07	76569.	376.55	+.15		17	376.53		+3.31
Pukoo Fish Pond	2304	וואי		527.57	.69594	367.16	+.12	·	22	367.06		-6.16
Kaunakakai	2341	72 / 27		535.67	76569.	372.79	60*+		26	372.62		-0.60
Wolokai Airport	9Aug61 0053	332		536.73	76569	373.53	+.02		33	373.22	,	
				,	·							
	,										. •	
	EARTH TIDE				OBSERVER	rver A2C Meyn	иA		COMPUTED BY	Stinnette	à	DATE 31 Aug 61
a. Dairt bu	A. DRIFT DURING TRIPS				RTSNI	INSTRUMENT #615			CHECKED BY Radtke &	bay e & Ramsey		1

				23	GRAVITY LOOP COMPUTATIONS	P COMPUTA	TIONS					
STATION	DATE	A TIME	COUNTER	MEAN	DIAL	MEAN	COR	CORRECTIONS TO MEAN DIAL, MGALS	TO	CORR	COUNTER	Δ 6.
	TIME	MIN.		D. U.	MGALS/D.U.	MGALS	-	2	8	MGALS	MGALS	MGALS
Molokai Airport	8Aug61 1921	25	. 5	21.77	9669*	15.10	+.11			15.21	347.05	,
Kaunakakai USGS BM	1946	29 25	5	20.90	9669°	14.50	+,13		02	17.61	347.05	. 09*0-
Hwy 45 Bridge	2015	21/21	5	08.47	9669°	05.87	+.14		70	05.97	347.05	-9.24
Kemalo USGS BM 39	2036	23 75	5	07.77	9669°	05.39	+.15		90*-	05.48	347.05	-9.73
Pukoo Fish Pond	2059	31 %	25	12.73	9669.	08.83	+.16		80	08.91	347.05	-6.30
Kanaha Point USGS BM 48	2130	707	5	16.07	9669.	11.15	+,16		10	11.21	347.05	00.4-
Halawa USGS BM 25	2210	769	5	26.87	9669.	18.64	+.15	·	13	18.66	347.05	+3.45
Pukoo Fish Pond	2304	223	5	12.77	9669.	08.86	+.12	•	17	08.81	347.05	-6.40
Kaunakakai	2341	72/27	5.	21.10	9669°	14.63	60*+		20	14.52	347.05	69.0-
Molokai Airvort	9Aug61 0053	332	5	22.27	9669°	15.45	+,02	·	-,26	15.21	347,05	
	,											
										,	•	
1. EARTH TIDE 2. DRIFT BETW	EARTH TIDE DRIFT BETWEEN TRIPS			,	OBSERVER 1/L	ادر ا	Schweninger	ų	computed by Stinned	Pureb BY Stinnette	DATE	T. 1 Aug 61
	DRIFT DURING TRIPS				INSTR	INSTRUMENT	#617		CHECKED BY Radtke &	osy e & Ramsey	ů .	Aug

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				GR	VITY LOO	GRAVITY LOOP COMPUTATIONS	TIONS					
STATION	DATE	A TIME	COUNTER	MEAN	DIAL	MEAN	CORR	CORRECTIONS TO	TO	CORR	COUNTER	7 €
	TIME	,		о. u.	MGALS/D.U.	MGALS	-	~		MGALS	MGALS	
	9Aug61 0053	792		536.73	76569.	373.53	+,02			373.55		
Puunana USGS Resevoir BM	6110	28 28		448.47	76569.	312.11	0.00		+.02	312.13		-61.42
USGS BM 1102 Manunaloa	0148	29 / 29		459.47	76569.	319.76	03		70*+	319.77		-53.78
Waieli Trig. Sta.	0217	122		491.13	76569.	341.80	05		90.+	341.81		-31.74
Kaeo Trian. Sta.	6070			478.43	76569	332.96	07		+.13	333.02		-40.53
Molokai Airport	0453	240	arah Pad-Pad V manasiana. A	536.63	76569.	97.676	40°-		+.16	373.55		
										,		
			Saultan ra w taun birqa									*
	9Aug61 0053		5	22.27	.6936	15.45	÷.02			15.47	347.05	
Puunana USGS Resevoir BM	0119	29 / 26	7	33.93	8669	73.54	00.0		+.01	.23.55	277.67	-61.30
USGS BM 1102 Mauna Loa	8710	29 / 55	7	45.17	\$669,	31.34	03		+.02	31.33	277.67	-53.52
Waieli Trig. Sta.	0217	78/111	7	76.77	. 6938	53.26	05		+.02	53.23	277.67	-31.62
Kaeo Trian. Sta.	8070	195	7	80.19	.6938	97.77	07		÷.06	44.45	277.67	07.05-
Molokai Airoort	0453	7240	5	22.30	. 6936	15.47	07		+.07	15.47	347.05	
1. EARTH TIDE 2. ORIFT BETW	EARTH TIDE ORIFT BETWEEN TRIPS				SEC	observer 1/Lt Schw	Schweninger	617	COMPUTED BY	ED BY Stinnette	DAT te 30	re 1912 61
3. DRIFT DU	DRIFT DURING TRIPS				INSTR	INSTRUMENT #6	#615 & #6	#617	СНЕСКЕВ ВҮ	osy Radtke	se DATE	re 31 Aug 61

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`	,-			3	GRAVITY LOOP COMPUTATIONS	P COMPUTA	TIONS	:			•	
STATION	DATE	A TIME	COUNTER	MEAN	DIAL	MEAN DIAL	COR	CORRECTIONS TO MEAN DIAL, MGALS	TO	CORR	COUNTER	. 06.
	TIME	MIN.		D. U.	MGALS/D.U.	MGALS	-	2		MGALS	MGALS	MGALS
Molokai Airport	9Aug61 1831	3	,	536.70	.76569*	373.51	70*+			373.55		•
Lanai Airport	1933	3 8		376.40	76569	261.95	4.30			262.05		-111.50
Hana Airport	9202	125		192.67	76569	36.77%	+.15			345.11		- 28.44
Kahului Airport	2108	157		436.07	.69594	303.48	+.17			303.65		06.69 -
Kahului Airport	15Aug61 0041	45		1510.10	76569.	1050.9%	+.13	74.42				
Hana Airport	9210	2000	14 13 7 of a	1570.15	76569."	1092.73	+,11	74742		345.42		- 28.13
Lanai Airport	9020	32 42		14,50,17	765697	1009.23	+.10	74742		261.91		-111.64
Molokai Airport	0238	71.2		1610.63	.69594	1120.90	+.07	-74742		373.55		
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1. EARTH TIDE	1. EARTH TIDE 2. ORIET BETWEEN TRIDE				OBSERVER		A2C Meyn		COMPUTED BY	Stinnette	DATE Se 31	re 1 Aug 61
3. DRIFT DU	DRIFT DURING TRIPS				FISH:	INSTRUMENT #6	#615		сиескерач Radtka &	ner ta & Ramsey	à	. aa

				eg.	GRAVITY LOOP COMPUTATIONS	P COMPUTA	SNOIT	• .	:		: 1	
STATION	DATE	16.1	COUNTER	MEAN	DIAL FACTOR	MEAN	COR	CORRECTIONS TO MEAN DIAL, MGALS	: TO	CORR	COUNTER	Δ 6.
	Tipe	K.		0. U.	MGALS/D.U.	MGALS	-	7	m	MGALS	MGALS	MGALS
Molokai Airport	9Aug61 1831	62	5	22.53	9269.	15.63	70"+			15.67	347.05	
Lanai Ariport	1933	53 62	3	61.97	7769.	43.03	+.10		0.00	43.13	208.23	-111.36
Hana Airport	2026.	42 415	7	81.37	8669.	56.45	+.15		0.00	56.60	277.67	- 28.45
Kahului Airport	2108	757	7	21.53	8669.	14.94	+.17		+0.01	15.12	277.67	- 69.93
Kahului Airport	15Aug61 0041	بحلت	15	08.60	.6927	06.79	+.13	75503			1070.89	
Hana Airport	0126	202	15	69,68	.6927	48.27	+.11	55,503	+.01	-706.64		- 28.47
Lanai Airport	0206	32 24.2	77.	50.27	5269:	34.81	+.10	75503	+.01	-720.11	971.64	-111.19
Molokai Airport	0238	722	16	10.83	.6933	12.70	+.07	75503	+.01	747.44	1110.16	
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1. EARTH TIDE 2. ORIFT BETY	1. EARTH TIDE 2. ORIFT BETWEEN TRIPS				OBSEF	observer 1/Lt Schweninger	ninger		COMPUTED BY	ED BY Stinnette	DATE	Sep 61
3. ORIFT DU	ORIFT DURING TRIPS				. INSTR	INSTRUMENT #617	27		CHECKED BY	oey e & Ramsey		

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		·		S.S.	GRAVITY LOOP COMPUTATIONS	COMPUTA	TIONS		,			
STATION	DATE	A TIME	COUNTER	MEAN	DIAL	MEAN	COR	CORRECTIONS TO MEAN DIAL, MGALS	TO	CORR	COUNTER	۵6.
	TIME	ž			MGALS/D.U.	MGALS	-	~	-	MGALS	MGALS .	MGALS
Kahului Airport	10Aug61 1926	12/		436.97	76569.	304.10	+.07			304.17		
Kahakuloa USGS BM	2100	75 FE		446.15	76569.	310.49	+.15		+.01	310.65		87*9+
Honokavai Hyy 30	2251	27 205		457.57	76569.	318.44	+.16		+.01	318.61		+14.44
Lahaina USGS BM	2318	232		448.60	76569.	312.20	+.15		+.01	312.36		+8.19
Olowalu Bridge	2341	770		448.33	76569.	312.01	+.13	ŗ	+.02	312.16		+7.99
Hwy 30 & 31 Intersection	11Aug61 0020			4,32,27	76569.	300.83	91.	ż	+.02	300.95		-3.22
Wailuku Court House	6600	313		426.43	76569°	296.77	+.09		+.02	296.88		-7.29
Kahului Airport	0103	337		436.93	76569.	30, 08	+.07		+.02	304.17		
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		, in the second										
1. EARTH TIDE	1. EARTH TIDE				OBSERVER	tver A2C Meyn	n A		COMPUTED BY	ED BY Stinnette	à	17E 30 Aug 61
S. DRIFT DURING TRIPS	RING TRIPS				INSTR	INSTRUMENT #6	#615		CHECKED BY	pay Radtke		Aug

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				GR	GRAVITY LOOP COMPUTATIONS	P COMPUT	VTIONS					
				MERK	DIAL	MEAN	COR	CORRECTIONS TO	0 1	CORR		
STATION	DATE	A TIME	COUNTER	0. c.	MGALS/D.U.	MGALS	-	2	-	MGALS	MGALS	MGALS
Kahului Airport	10Aug61 1926	1 3	. 4	22.07	8669	15.31	+.07			15.38	277.67	
Kahakuloa USGS BM	2100	7-	4	31.18	.6938	21.63	+.15		05	21.73	277.67	+6,35
Honokovaí Hvy 30	2251	23/25	7.	42.83	. 6938	29.72	+.16		11	29.77	277.67	+14.39
Lahaina USGS BM	2318	23 23	7	34.03	\$669.	. 19*82	+.15		-, j2	23.64	277.67	+8.26
Olowalu Bridge	2341	N_{ω}	4	33.70	.6938	23.38	+,13	·	14	23.37	277.67	66*4+
Hwy 30 & 31 Intersection	11Aug61 0020	19 24	4	17.60	\$669.	12.21	+.10		16	12.15	277.67	-3.23
Wailuku Court House	6600	7313	7	11.93	8669*	08.28	60*+		17	08.20	29.772	-7.18
Kahului Airport	εστο	337	7	22.33	.6938	15.49	+.07	•	18	15.38	277.67	
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	•••										,	
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1. EARTH TIDE 2. DRIFT BETW	1. EARTH TIDE 2. DRIFT BETWEEN TRIPS				OBSE	OBSERVER Lt Schw	Schweninger	L	COMPUTED BY	ED BY Stinnette		DATE 30 Aug 61
3. DRIFT DU	DRIFT DURING TRIPS				INST	INSTRUMENT #6	#617	·	СНЕСКЕВ ВҮ	bev Radtke		DATE 31 Aug 31

1381 FORM 0-14

		,		GR	GRAVITY LOOP COMPUTATIONS	P COMPUTA	SHOIL					
STATION	DATE	NI NI	COUNTER	MEAN	DIAL	MEAN	COR	CORRECTIONS TO MEAN DIAL, MGALS	5 TO	CORR	COUNTER	Δ σ.
Kabului	11Aug61	W. Kr.		n i	MGALS/ 0.U.	MGALS		2	m	MGALS	MGALS	MGALS
	2002	86		437.50	,69594	304.47	+.09			304.56		
Hwy 37 Makena Jct Hwy 31	214.5	267		277.80	76569°	193.33	+,16		01	193.48		-111.08
Puu Maneoneo Trian. Sta.	12Aug61 0212	83		411.15	76569*	286.14	02		04	286.12		-18.44
Kipahulu USGS BM 192	0335	37/3		451.70	76569.	314.36	05		-,05	314.26		+ 9.70
Muolea USGS BM 335	0412	63 / 63		460.87	.69594	320.74	07		05	320.62		+16.06
Hana Airport	0515	24.8		497.24	76669.	346.05	08		06	345.91		+41.35
Hana Airport	12Aug61 1744	67		74-767	76564*	346.21	07	17				
Nahiku USGS BM 44-M-1923 on	1833	25		413.00	76569.	287.42	03	17	17	287.15		-17.41
Koolau Ditch Intake	1858	84 822		373.93	76569°	260.23	.01	17	07	259.98		-44.58
Kailua USGS BM M-11-1923	2022	56/25		409.13	76569.	284.73	+.07	17	80°-	284.55		-20.01
Kalku USGS BM	2118	41 /62		420.57	76569:	292.69	+.12	17	09	292.55		-12.01
Kahului Airport	2159.	£083		437.80	.69594	304.68	+.14	17	09	340.56		
										,		
	·									^		
1. EARTH TIDE 2. DRIFT BETWEEN TRIPS	NE TRIPS				OBSERVER		A2C Meyn	·	COMPUT	COMPUTED BY Stinnette	ď	DATE 30 Aug 61
3. DRIFT CUR	DRIFT CURING TRIPS				RTSNI .	INSTRUMENT #615	5		СНЕСКЕВ ВУ	p sy Padtke		DATE 31 Aug 61

				35	GRAVITY LOOP COMPUTATIONS	COMPUTA	TIONS					•
NO. IT A IT.	DATE	A TIME	COUNTER	MEAN	DIAL	MEAN	COR	CORRECTIONS TO MEAN DIAL, MGALS	TO	CORR	COUNTER	Δ 6.
	TIME			D. U.	MGALS/D.U.	MGALS		2	m	MGALS	MGALS	MGALS
Kahului Airport	11Aug61 2007	86	. 7	22.70	8669.	15.75	+.09			15.84	277.67	
Makena Hwy 37 Jet Hwy 31	2145	152	8	62.93	9769*	12.67	+,16		+.07	73.67	138.77	-110.80
Kepuni Bridge	12Aug61 0017	115	9	51.80	7769	35.97	+.13		+.18	36.28	208.23	-49.00
Puu Maneoneo Trian. Sta.	2120	365	6	95.58	7769.	. 46.37	+.02		+.26	66.65	208.23	-18.63
Kipahulu USGS BM 192	0335	37 448	7	36.07	.6938	25.03	05		+.32	25.30	277.67	+9.46
Mualea USGS BM 335	2170	63 485	7	45.30	8669	67*16	40°-		+.35	31.71	277.67	+15.87
Hana Airport	0515	24.8	7	81,84	.6938	56.78	80*-		07*+	57.10	277.67	+41.26
Hana Airport	1744	67	7	82.33	.6938	57.12	07	35				*
Nahiku USGS BM 44-M-1923 on Bridge	1833	25 / 25	3	19.16	7769.	67.82	03	35	+.43	67.87	208.23	-17.41
Koolau Ditch	1858	85 622 88	٣	58.60	7769*	69.07	01	35.	+.45	40.78	208.23	-44.50
Kallua USGS BM M-11-1923	2022	32 38	3	93.77	7769.	65.11	+.07	35	+,51	65.34	208.23	-19.94
Haiku USGS BM	2118	23/13	7	04.93	.6938	03.42	±.12	35	+.55	03.74	277.67	-12.10
Kahului Airport	2159	803	7	22.30	8669*	15.47	4.14	35	+.58	15.84	277.67	
	,											
1. EARTH TIDE	IDE				3880	OBSERVER Lt Sch	Schweninger	er	COMPUTED BY		Stinnette	DATE 30 AUG 61
2. DRIFT BE.	DRIFT BETWEEN TRIPS	em			INST	INSTRUMENT #617	7.		CHECKED BY	oay Radtke		DATE 31 Aug 61
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				25	VITY LOO	GRAVITY LOOP COMPUTATIONS	LTIONS					\.
STATION	2446	٨	COUNTRY	MEAN	OIAL	MEAN	COR	CORRECTIONS TO	5140	CORR		<
	TIME	į E .		, i	MGALS/0.U.	MGALS	-	*	-	MGALS	MGALS	MGALS
Kahulud Alrport	13Aug61 2343	197		1509.17	76569	1050.29	+.15			1050.44		
Makayao USGS BM	14Aug61 0300	7 33		1369.40	76569.	971.81	+,02		09	971.74		-78.70
Upper Pala USC&GS BM	9070	263		1502.12	76569.	1045.39	03		12	1045.24		-5.20
Kihei USC&GS BM	0453	3,310		1519.17	.695%	1057.25	90		77	1057.05		19.91
Kahului Airport	0520	337		1509.70	.69594	1050.66	07		15	1050.44		
						,						
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								·		·		۳
	,	•										
Kahului Airport	13Aug61 2343	197		01,60	.6927	06.30	+.15			57-90	1070.89	
Makavanu USGS BM	14Aug61 0300	\$ 73	. ,	96.13	6269.	66.61	+.02		70°	66.59	902.35	07.87-
Upper Pala USC&GS BM	9070	47 /		02.15	.6927	ó1.49	03		05	01.41	1040.89	-5.04
Kihei USC&GS BM	6570	2320		19.07	.6927	13.21	90		06	13.09	1040.89	45.64
Kahului Airport	0520	337		09.52	.6927.	06.59	07		07	06.45	1040.89	
1. EARTH TIDE 2. ORIFT SETW	1. EARTH TIDE 2. ORIFT SETWEEN TRIPS				oeser Lt So	observer A2C Meyn Lt Schweninger 517		615	COMPUTED BY	ED 8Y Stinnette	otte 30	.€) Aug 61
3. DRIFT SU	DRIFT DURING TRIPS				HISTR	SHSTRUMENT #615	5 & 617		снескер вү	s ay Padtke	DATE 31	31 Aug 61

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				23	WITY LOO	GRAVITY LOOP COMPUTATIONS	TIONS					
STATION	DATE	A TIME	COUNTER	MEAN	DIAL	MEAN	COR	CORRECTIONS TO MEAN DIAL, MGALS	TO TALS	CORR	COUNTER	Δ 6.
	TIME	ž	-	. u.	MGALS/D.U.	MGALS	-	7	-	MGALS	MGALS	MGALS
Kahului Airport	14Aug61 1810	3		1510.10	76569*	1050.94	90*-			1050.88		
Haleakala Crater	1945	3 %		661.47	76569.	76.097	02		02	760.30		-590.58
Haleakala USC& GS Trian. Sta. Kulekule	2016	126		558.87	76569.	388.94	0.00		02	388.92		-661.96
Kahului Airport	2143	213		1509.97	.69594	1050.85	+.07		70	1050.88		
Kahului Airport	14Aug61 1810	95	15	76.60	.6927	06.91	90*			06.85	1040.89	*
Haleakala Crater	1945	31 95	9	59.73	7669.	77.17	02		01	41.39	17.917	-589.94
Halearala ISC& GS Trian. Sta. Kolekole	2016	126	5	57:03	9669.	39.56	0.00	2	02	39.54	347.05	-661.15
Kahului Airport	57173	213	- 15	.09.83	. 6927	06.81	+.07		03	.06.85	1040.89	
·										·		
	· ·											
1. EARTH TIDE 2. DRIFT BETT	EARTH TIDE DRIFT BETWEEN TRIDS				OBSERVER Lt Sch	sserver A2C Meyn Lt Schwininger (leΨ	615 517	COMPUTED BY	ED BY Stinnette	Pa	7e 30 Aug 61
3. DRIFT OU	DRIFT DURING TRIPS				INST.R.	INSTRUMENT #615			CHECKED BY	osy Radtke		Aug

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		,	•	83	AVITY LOO	GRAVITY LOOP COMPUTATIONS	TIONS					
STATION	DATE	A TIME COUNTER	COUNTER	MEAN	DIAL	MEAN	COR	CORRECTIONS TO MEAN DIAL, MGALS	F TO	CORR DIAL	COUNTER	Δ 6.
	TIME	MIN.		D. U.	MGALS/D.U.	MGALS		2	•	MGALS	MGALS	MGALS
Hickam MATS Term	16Aug61 1649	777	•	1575.00	76569*0	10%01	+.02			1096.13		
Kon a Airport	1928	159		1453.42	76569*0	1011.49	03		08	1011.38		- 84.75
Kamuela Airport	2015	306		1344.17	0.69594	935.46	02		1.	935.33		-160.80
Kamuela Airport	22Aug61 2045	39		1348.90	0.69594	938.75	+,17	-3.48		,		
Kona Airport	2124	239 72		1458.00	76569.0	89°71.01	+.15	87°£-	13	1011.22		- 84.91
Hicksm MATS Term	23Aug6 1 0123	7,8%		1580.45	76569.0	1099, 90	70*-	-3.48	25	1096.13		
Loop 6		33		, and the second								
Kickam MATS Term	23Aug61 2303	23		1580.80	0.69594	1100.14	+.12			1100.26		
Bishop Museum	2336	727		1608.40	0.69594	1119,35	÷, 10		+.01	1119.46		+19.20
Hicksm MATS Term	2357			1580.83	0.69594	1100.16 +.08	+.08		+.02	1100.26		
	•				·)) (1)					, .	
·	a.e.									·		
1. EARTH TIDE 2. DRIFT BETWEEN TRIBS	OK FWEFV TRIBA				OBSERVER	EVER A2C Mayn	8 Vn		COMPUTED BY	UTED BY Stinnette	DATE	70 Con 67
3. DRIFT DURING TRIPS	RING TRIPS				INSTR	INSTRUMENT #615			CHECKED BY	Wenthy D	DATE	4

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				28	GRAVITY LOOP COMPUTATIONS	P COMPUTA	TIONS		[]			
STATION	DATE	A TINIE	COUNTER	MEAN	DIAL	MEAN	COR	CORRECTIONS TO	TO TALS	CORR	O T T NII O C	\ <
	TIME				MGALS/D.U.	MGALS	-	2	m	MGALS	MGALS	MGALS
Hickam MATS Term	16Aug61 1649	159	15	72.57	0.6927	51.65	+ 05			51.67	1040.89	
Kone Airport	1928	1.7	7	52.20	0.6925	36.15	03		+.10	36.22	971.64	- 84.70
Kamuels Airport	2015	506	13	43.17	0.6929	29.9⊡	-,02	1/4	+.13	30.02	902.35	-160.19
Kamuela Airport	22Aug61. 2045	<u>_</u>	13	46.57	0.6929	32.27	+.17	-2.25	,			
Kona Airport	2124	239	77	55.70	0.6925	38.57	+.15	-2.55	+.16	36.33	971.64	- 84.59
Hickam MATS Term	23Aug61 0123	1.84	15	77.88	0.6927	53.95	70	-2.55	+.31	51.67	1040.89	
Loop 6												*
Hickam MATS Term	23Aug61 2303	33	15	78.30	0.6927	54.24	+.12			54.36	1040.89	
Bishop Museum	2336	23	16	06.07	0.6933	04.21	+, 10	·	02	04.29	1110,16	+ 19.20
Hickem MATS Term	2357	277	15	78.40	0.6927	. 54,31	80°+		03	54.36	1040.89	
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					·							
1. EARTH TIDE 2. DRIFT BETW	EARTH TIDE ORIFT BETWEEN TRIPS			,	OBSERVER Lt Sc	Schweninger	Per		COMPUTED BY	Epsy Stinnette	ià .	17E 29S an 6.0
B. DRIFT DURING TRIPS	IRING TREPS				INSTR	INSTRUMENT #617			CHECKED BY	oev Waring R.		DATE 20ct61

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				25	GRAVITY LOOP COMPUTATIONS	P COMPUTA	TIONS					,
		- V	TA A STATE OF	MEAN	DIAL	MEAN	COR	CORRECTIONS TO	TO	CORR	COUNTER	Δ 6.
200	TIME	J		0 . C	MGALS/D.U.	MGALS	-	2		MGALS	MGALS	MGALS
Kamuela Airport	16Aug61 2015	55	<u> </u>	1344.17	0.69594	935.46	02			935.44		,
Hilo, Gen. Lyman Field	2110	255		1491.20	0.69594	1037.79	0.00		03	1037.76		+102.30
Hilo, Gen. Lyman Field	17Augé1 1855	39		1491.93	0.69594	1038.29	0,00	50/	·			
Hwy 19 South Pepeeked Jct.	1934	36 86		1482.23	0.69594	1031.54	01	50	90*-	1030.97		+ 95.53
Nanue Bridge	7007	124,		1528.37	76569.0	1063.65	-,01	50	-,08	1063.06		+127.62
Kilau Bridge	2045	30 / 165		1505.50	76569*.0	1047.74	01	50	10	1047.13		+111.69
Waipunahina Bridge	2115	7 55		1494.87	76569.0	1070.34	01	50	12	1039.71		+104.27
Honokaa	2146	27 / 256		1465.57	0.69594	1019.95	00.0	50	77	1019.31		+ 83.87
Kukuihaele	2237	\$ 27.7		1504.10	76569.0	1046.76	+.02	50	17	1046.11		+110.67
Kamuela Airport	2346	77.6		1345.10	0.69594	936.11	7 0.+	50	21	87.266	,	·
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·				•								
1. EARTH TIDE	EARTH TIDE DRIFT BETWEEN TRIDS		:		OBSERVER	RVER A2C Megn	ux		COMPUTED BY	ED BY Stinnette		DATE 28Sep61
3. DRIFT OU	DRIFT OURING TRIPS				HTSH	INSTRUMENT #615	10		CHECKED BY War	waring R.		►
1 0 Mags 1000												

				GR	GRAVITY LOOP COMPUTATIONS	P COMPUTA	LTIONS					
STATION	DATE	Ä	COUNTER	HEAN	DIAL	MEAN	COR	CORRECTIONS TO MEAN DIAL, MGALS	TO FALS	CORR	COUNTER	Δ 6.
7.	TIME	MIN.		o. u.	MGALS/D.U.	MGALS	-	7	-	MGALS	MGALS	MGALS
Airport	16Aug61 2015	55	55	43.17	0.6929	29.91	02		······································	29.89	902.35	
Hilo, Gen. Lyman Field	2110	25	75,	9.60	0.6925	62.74	0.00		90	62.68	971.64	+102.08
Hilo, Gen. Lyman Field	17Augél 1855	<u> 8</u>	77.	90.87	0.6925	62.93	0.00	61:-				
Hw 19 South Pepeeked Jct.	1934	35 88	77	81.20	0.6925	56.23	01	19	OI: -	55.93	971.64	+95.33
Manue Bridge	2004	122	15	27.33	0.6927	18.93	01	- 19	77	18.59	1070.89	+127.24
Kilau Bridge	2072	30 7	15	04.50	0.6927	03.12	-,01	19	-, 18	02.74	1040.89	+111.39
Waipunahina Bridge	2115	31 195	7,4	93.93	0.6925	65.05	01	-,19	21	79.79	971.64	+104.04
Honokaa	2146	51 226	17	64.60	0.6925	72.77	00.0	19	25	77.30	971.64	+83.70
Kukuinaele	2237	69	15	03.33	0.6927	02.31	+.02	-,19	30	01.84	1040.89	+110.49
Kamuela Airport	2346	346	13	43.90	0.6929	30.42	70°+	19	38	29.89	902.35	
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			,									
1. EARTH TIDE 2. DRIFT BETW	EARTH TIDE ORIFT BETWEEN TRIPS				GBSERVER Lt S	aver Lt Schweninger	inger		computed by Stin	rep ay Stinnette		s Sep 61
3. DRIFT OU	DRIFT DURING TRIPS				RISKI	INSTRUMENT # 617			CHECKED BY Waring	oey ing P.	DATE 2	E 2 Oct 61
TART FORM O. T.L.												

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				3	GRAVITY LOOF	LOOP COMPUTATIONS	TIONS		ļ 			
STATION	DATE	A TIME	COUNTER	MEAN	DIAL	MEAN	COR	CORRECTIONS TO	TO	CORR	COUNTER	Δ 6.
	TIME		***************************************	ກ່ ຕໍ	MGALS/D.U.	MGALS	-	12	m	MGALS	MGALS	MGALS
Kamuela Airport	17Aug61 2346			1345.10	0.69594	936.11	+.04			936.15		
Waimea	18Aug61 0104	25/28		1298.53	76569.0	903.70	+.07		05	903.72		-32.43
Upolu Airport	0208	20/42		1492.47	0.69594	1038.67	90°+		08	1038.65		+102.50
Manukona Landing	0258	7 232		1484.58	0.69594	1033.25	90*+		11	1033.20		+97.05
Halawa	. 2170	78 / 78		1506.23	76569.0	1048.25	70"+		15	1048.14		+1111.99
Kamuela Airport	0530	344		1345.43	0.69594	936.34	+.01		2	936.15		
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1. EARTH TIDE 2. DRIFT BETW	EARTH TIDE DRIFT BETWEEN TRIDS				OBSERVER	1	A2C Meyn		COMPUTED BY	ED BY Stinnette	DATE 28 S	Sep 61
3. DRIFT OU	DRIFT OURING TRIPS				INSTR	INSTRUMENT #615	5		CHECKE	CHECKED BY Waring	. <u></u>	· .

				95	GRAVITY LOOP COMPUTATIONS	COMPUTA	TIONS					
STATION	DATE	111	COUNTER	MEAN	DIAL	MEAN	COR	CORRECTIONS TO	TO	CORR	COUNTER	۵ و.
	TIME	MIN.		o. u.	MGALS/0.U.	MGALS	,-	2	3	MGALS	MGALS	MGALS
Kamuela Airport	17Aug61 2346	73%	13	73.90	0.6929	30.42	+.04	,		97.08	902.35	
Waimea	18Aug61 0104	78/79	12	97.10	0.6937	67.36	+.07		01	67.42	832,98	-32.41
Upolu Airport	0,203	51/12	77	91.43	0.6925	63.32	90*+		02	63.36	971.64	+102.19
Manukona Landing	0259	73 /	77	83.53	0.6925	57.84	+,06		.02	57.88	971.64	+96.71
Halawa	0412	7266	15	05.33	0.6927	03.69	70*+		03	03.70	1040.89	+111.78
Kamuela Airport	0530	344	F3	00.47	0.6929	30.49	+.01		70	30.46	902,35	
					an Voca Indiplant							
												*
	•	,		-								
1. EARTH TIDE	DE				OBSERVER Lt Sc	erver Lt Schweninger	nger		COMPUTED BY	Stinnette	·	1 Can 61
3. DRIFT DUF	DRIFT BURING TRIPS				. INSTR	INSTRUMENT #617			CHECKED BY Wari	ED BY Waring R.		DATE 2 Oct 61

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		•		.	AVITY LOO	GRAVITY LOOP COMPUTATIONS	LTIONS		 - -				
STATION	DATE	∆ TINE	COUNTER	MEAN	DIAL	MEAN	COR	CORRECTIONS TO	S TO	CORR	, and a	ļ	
	TIME			D, U,	MGALS/D.U.	MGALS	-	7	E	MGALS	MGALS		MGALS
Kamuela Airport	18Aug61 1805	25	•	1345.77	76569.0	936.58	÷.05			936.63			
Makahuna Bridge	1900	118		1522.97	0.69594	1059.90	+.03		01	1059.92		+12	+123.29
Waipunahina Bridge	2058	1273		1495.73	0.69594	1070.94	00.00		70	1040.90		70[+	+104.27
Hilo, Gen. Lyman Field	2217	170		1492.87	76569.0	1038.95	0.00		90	1038.89		101+	+102.26
Кевац	19Aug61 0107	51 / 22	,	1469.23	76569.0	1022.50	+.03		01	1022.43		1	+85.8.
Pahoa	0158	40 473	- du-Ball Hillsuin Vyra	1258.63	76569°0	1015.12	+.04		11	1015.05	,	3/_+	+78.42
.Kalapana	0238	62 / 513		1480.90	76569.0	1030.62	70 °+	,	12	1030.54		+63	+93.91
	0340	133	 ,	1488.23	76569.0	1035.72	+.04		77	1035.62		86+	+98.99
Hilo, Gen. Lyman Field	0553	80/		1493.00	0.69594	1039.04	+.02		17	1038.89		+102.26	.26
Hilo, Gen. Lyman Field	1819	113		1493.33	0.69594	1039.27	+.08	29	,		٠.		
Fahala	2012	222		1382,93	76569:0	77.296	70°+	29	20	961.99	 - -	+25	+25.36
Hilea	2072	70 70	,	1451.77	.76569*0	1010.34	+.04	29	20	1009.89		£77	+73.26
Naalehu		227		1409.73	76569.0	981.09	+.01	29	22	980.59		+43	43.%
Kealakekua	20Augo1 0139	777.8		1347.67	0.69594	937.90	00.0	29	28	937.33		₽	10.70
1. KARTH TIDE 2. DRIFT BETW	EARTH TIDE DRIFT BETWEEN TRIPS	,			OBSERVER	A2C	Meyn		COMPUT	COMPUTED BY Stinnette		DATE 29	Sep 61
3. DRIFT DU	DRIFT DURING TRIPS				. INSTR	INSTRUMENT # 6	# 615		CHECKED BY Wa	bev Waring R.		DATE	

1805 2217 170 14 2017 14 2017					23	GRAVITY LOOP COMPUTATIONS	COMPUTA	TIONS				•	
1805 1900 118					MEAN	DIAL	MEAN	CORR	ECTIONS DIAL, MG	To ALS	CORR	COUNTER	0.6
18hug61 55 13 44.00 0.6929 30.49 +.05	STATION	TIME	4	N N N N N N N N N N N N N N N N N N N		MGALS/D.U.	MGALS	-	7	-	MGALS	MGALS	MGALS
Hallone 2058. 113 14 94.37 0.6925 65.35 0.0002 Hillone 2058. 173 14 94.37 0.6925 65.35 0.0006 Hield 2217 170 14 94.37 0.6925 65.38 0.0008 198. 0238 6275 14 67.80 0.6925 46.95 +.0312 198. 0238 6275 14 67.80 0.6925 39.68 +.0415 Held 0553 770 14 87.17 0.6925 60.37 +.0415 Held 1819 113 14 92.10 0.6925 63.78 +.08 7.32 2012 851 14 92.10 0.6925 63.78 +.08 7.32 10 202 70 140 0.6925 60.37 +.0412 Held 2152 227 14 60.50 0.6925 63.78 +.08 7.32 10 2152 227 14 50.50 0.6925 31.94 0.03230 skus 208ug61 1148 13 46.10 0.6929 31.94 0.003237	Kamuela Airport	18Aug61 1805	55	13	74.00	0.6929	30.49	+.05			75.06	902.35	•
Hilma 2058	Makahuna Bridge	1900	118	15	21.37	0.6927	14.80	+.03		02	14.81	1040.89	+122.81
Gen. 252 L 91.53 0.6925 63.38 0.00 08 Field 19Aug61 472 L 67.80 0.6925 46.95 +.03 1L na 0158 401 1 57.30 0.6925 39.68 +.04 1L na 0238 657 L 79.37 0.6925 54.96 +.04 1L Gen. 0340 133 L 87.17 0.6925 60.37 +.04 1D Field 0553 708 L 91.73 0.6925 60.37 +.04 1D Field 133 L 87.17 0.6925 60.37 +.04 12 Field 133 L 92.10 0.6925 63.78 +.04 32 23 Field 130 1 92.10 0.6925 34.97 +.04 32 23 a 2042 3 3 3 3	Waipunahina Bridge	2058.	79	Z	94.37	0.6925	65.35	00.00		90	62.29	971.64	+107.07
19hug61	Hilo, Gen. Lyman Field	2217	121	73	91.53	0.6925	63.38	00.0		90	63.30	971.64	+102.05
na 0238	Kesau	19Aug61 0107	27 12	77	67.80	0.6925	56:97	+.03		14	78.97	971.64	+85.59
na 0238 62 14 79.37 0.6925 54.96 +.0417 Gen. 0340 133 14 87.17 0.6925 60.37 +.0419 Gen. 1819 113 14 92.10 0.6925 63.78 +.0832 Gen. 2012 821 13 81.53 0.6929 56.49 +.043225 u 2152 227 14 50.50 0.6925 34.97 +.043227 u 2152 227 14 50.50 0.6925 34.97 +.043227 ekua 20Aug61 1148 13 46.10 0.6929 31.94 0.003237 • EANTH TIOE		01,58		71	57.30	0.6925	39.68	+.04	` .	15	39.57	971.64	+78.32
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Kalapana	0238	513	77	79.37	0.6925	54.96	+.04		-,17	54.83	971.64	+93.58
Gen. O553 708 14 91.73 0.6925 63.52 +.02 23 Gen. Field 1819 113 14 92.10 0.6925 63.78 +.08 32 Field 1819 113 14 92.10 0.6925 56.49 +.04 32 26 Field 2012 851 13 81.53 0.6929 56.49 +.04 32 26 u 2152 921 14 50.50 0.6925 34.97 +.04 32 27 u 2152 921 14 68.30 0.6925 34.97 +.04 32 32 37 ekua 204ug61 1148 13 46.10 0.6925 31.94 0.00 32 37 1 2027 1 46.10 0.6929 31.94 0.00 32 37 1 2 2 2 2	Pohoki	.0340	133	77	87.17	0.6925	60.37	+.04	<u> </u>	19	60.22	971.64	+98.97
Gen. 1819 113 14 92.10 0.6925 63.78 +.08 32/-32 32/-32 Field 2012 821 13 81.53 0.6929 56.49 +.04 32 26 u 2042 70 14 50.50 0.6925 34.97 +.04 32 26 u 2152 921 L 08.30 0.6925 05.75 +.01 32 37 ekua 20Aug61 1148 13 46.10 0.6925 31.94 0.00 32 37 . EANTH TIDE	Hilo, Gen. Lyman Field	0553	708	7.7	91.73	0.6925	63.52	+.02		23	63.31	971.64	+102.06
a 2012 821 30 13 81.53 0.6929 56.49 +.04 32 26 hu 2042 70 14 50.50 0.6925 34.97 +.04 32 27 hu 2152 921 227 14 08.30 0.6925 05.75 +.01 32 37 kekua 20139 1148 13 46.10 0.6929 31.94 0.00 32 37 1. EARTH TIDE	Hilo, Gen. Lyman Field	1819	113	i i	92.10	0.6925	63.78	+.08	-32	•			
hu 2152 227 14 50.50 0.6925 34.97 +.043227 37 14	Pahala	2012	30 /		81.53	0.6929	56.49	+.04		26	55.95	.902.35	+25.41
Kua 20Aug61 1148 13 46.10 0.6929 31.94 0.003237 EARTH TIDE 2152 927 14 08.30 0.6929 31.94 0.003237 COMPUT	Hilea	2075	%) I /	7	50.50	0.6925	34.97	70°+	•	27	. 34.42	971.64	+73.17
20Aug61 1148 13 46.10 0.6929 31.94 0.003237 0139 7777 0139 095ERVER Lt. Schweninger comput	Naalehu	2152	227	L	08.30	0.6925	05.75	+.01	32	30	05.14	971.64	+43.89
COMPUTE COMPUT	Kealakekua	20Aug61 0139	1113		01.97	0.6929	31.94	00.0	32	37	31.25	902.35	+0.71
ONET SET SEEN TRIPS	÷ 4	DE TWEEN TRIPS			,	OBSE	ᆲ	hwenin	ger	COMPUT	C!	ààà	29Sep61
#617		NING TRIPS					- 1	517		M'B	ring R.		20ct61

1361 FORM 0-14

STATION	DATK	· ñ.	COUNTER	GR. MEAN DIAL	GRAVITY LOOP COMPUTATIONS DIAL NEAN COI	MEAN DIAL	COR	CORRECTIONS TO MEAN DIAL, MEALS	TO	CORR	COUNTER	
Kealakekua	20Aug61 0139			o d	שפערא היה.	CV2	-	~	n	STATE ,	S Y S Y	
Kona Alrport	0232	72 7201		1455.60	0.6959	10.6101	+.02	29	29	1012.45		+75.82
Puusnahulu	77/20	2223		1262.70	0.69594	878.76	+,03	29	31	878.19		-58.44
Auwalakeakua Bridge	0415	2922		1274.33	0.695%	886.86	+.03	29	31	886.29		-50.34
Kamuela Airport	7770	1333		1346.67	0.69594	937.20	70° +	29	-,32	936.63		·
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1. EARTH TIDE 2. ORIFT BETW	EARTH TIDE ORIFT BETWEEN TRIPS				OBSERVER	`}	A2C Meyn	·	COMPUT	compured by Stinnette		DATE 29 Sep 61
S. DRIFT DU	DRIFT DURING TRIPS				INST	-INSTRUMENT #615	5		снескер ву Waring	ckebey Waring R.		DATE

1381 FORM 0-14

				33	GRAVITY LOOP COMPUTATIONS	P COMPUTA	SNOIT					
		4	a a a a a a a a a a a a a a a a a a a	MEAN	DIAL	MEAN	COR	CORRECTIONS TO MEAN DIAL, MGALS	TO	CORR	B S T N II O O	9 <
	TIME	N. I		ה ה ה	MGALS/D.U.	MGALS	-	7	-	MGALS	MGALS	MGALS
Kealakekua	20Aug61 0139	53/			,							
Kona Airport	0232	72 7201	77	54.27	0.6925	37.58	+.02	32	39	36.89	971.64	79.57+
Pouanahulu	7760	7273	12	61.13	0.6937	17.27	£0°+	32	17	11.71	832.98	-58.20
Auvaiakeakua Bridge	0415	30,7	12	72.57	0.6937	50.34	+,03	32	42	69.67	832.98	-50.28
Kamuela Airport	7770	7333	13	45.10	0.6929	31.25	70.+	-:32	43	30.54	902.35	
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1. EARTH TIDE	1. EARTH TIDE				OBSERVER	RVER Lt Schwe	Schweninger		COMPUTED BY	ED BY Stinnette	DA	re 29 Sep 61
1. DRIFT DU	DRIFT DURING TRIFS	·			INSTR	INSTRUMENT #617			снескер ву Wari	ebay Waring R.	DATE	2 Oct

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	•	,		GR	WITY LOO	GRAVITY LOOP COMPUTATIONS	TIONS	,		٠	. •	
STATION	DATE		COUNTER	MEAN	DIAL	MEAN	COR	CORRECTIONS TO MEAN DIAL, MGALS	70 ALS	CORR	COUNTER	Δ 6.
	TIME	MIN.	,	ð, u.	MGALS/D.U.	MGALS	1	2	m	MGALS	MGALS	MGALS
Kamuela Airport	20Aug61 2049	11 80		1347.17	0.69594	937.55	+.07			-937.62		
Waikii	2215			1099.70	76569.0	765.33	+,02		03	765.32		-172.30
Hilo, Gen. Lyman Field	21Augé1 0019	210		14%.43	0.69594	10,00.03	03		07	1039.93		+102.31
Hilo, Gen Lyman Field	1856	517		1495.13	0.695%	1040.52	+.15	19		1		
2.8 mi. S. of Mtn. View	1947	197 03	·	1325.57	0,69594	922.52	+.15	67	09	921.91		-15.71
Volcano House	2027	301		1201.50	76569.0	836.17	+.13	67	01	835.53		-102.09
Volcano House	22Aug61 0020	87		1201.83	76569.0	836.40	03	07				
HWF 11 USGS BM 3640	0108.	135/2		1226.70	0.69594	853.71	05	77.	12	852.80		-84.82
Hilo, Gen. Lyman Field	0323	787		1495.47	0.69594	1040.76	05	74	17	1039.80		+102.18
Hilo, Gen. Lyman Field	1908	. 16		1495.67	0.69594	1070.90	+.17	36				
Kamuela Airport	2072	7,81		1348.90	0.69594	938.75	+.17	4.30	20	937.62		
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1. EARTH TIDE 2. DRIFT BETW	EARTH TIDE ORIET BETWEEN TRIPS				OBSERVER		A2C Meyn		COMPUTED BY	ED.BY Stinnette		29 Sen 61
3. DRIFT DU	DRIFT DURING TRIPS				INSTR	INSTRUMENT #	# 615		CHECKED BY	Day Waring R	-	1
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				2	GRAVITY LOOP COMPUTATIONS	P COMPUTA	LTIONS					
STATION	DATE	A TIME D	COUNTER	MEAN	DIAL	MEAN	MEA.	CORRECTIONS TO	\$ TO	CORR	COUNTER	δ6.
	TIME			D. U.	MGALS/D.U.	MGALS	-	2	·	MGALS	MGALS	MGALS
Kamuela Airport	20Aug61 2049	7/1/8		45.27	0.6929	26516	+.07			31.44	902.35	*
Waikii	2215	38 38	OL.	97.27	0.6950	67.60	+.02		70	67.58	694.03	-172.18
Hilo, Gen. Lyman Field	21Aug61 0021-	212	7	92.67	0.6925	64.17	03		:	64.03	971.64	+101,88
Hilo, Gen. Lyman Field	1856	35	7	92.77	0.6925	r. 79	+.15	25				
USGS BM HWY II 2.8 miles S. of Mtn. View	1952	35 268	13.	23.25	0.6929	16.11	4.14	25	77	15.86	902.35	-15.58
	2027	303	11	77.86	0.6945	09.89	+.13	25	16	68.32	763.53	-101.94
Volcano House	22Aug61 0020	87	11	99.13	0.6945	68.85	03	03 32				
Hwy II usgs Em 3640	8010	135 351	715	23.93	0.6937	16.60	05	34	18	16.03	832.98	-84.78
Hilo, Gen. Lyman Field	0323	7,86	73	93.23	0.6925	64.56	05	34	25	63.92	971.64	+101.77
Hilo, Gen. Lyman Field	1908	. 6	7.7	63.43	0.6925	64.70	+.17	36				
Kamuela Airport	2045	583	13	46.57	0.6929	32.27	+.17	70	30	31.44	902.35	
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				,								
1. EARTH TIDE 2. DRIFT BETW	1. EARTH TIDE 2. DRIFT BETWEEN TRIPS				observer Lt	iver Lt Schweninger	ninger		COMPUTED BY Stinne	Pureb my Stinnette	DATE 299	ATE 29Sep61
3. ORIFT DU	DRIFT DURING TRIPS				INSTR	INSTRUMENT #6	#617		CHECKED BY Waring	ckepsy Waring R.	DA	DATE 20ct61
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		,		SS.	GRAVITY LOOP COMPUTATIONS	COMPUTA	TIONS		<u> </u> 			
STATION	DATE	A TIME	COUNTER	MEAH	DIAL	MEAN	COR	CORNECTIONS TO MEAN DIAL, MGALS	F TO	CORR	COUNTER	Δ 6.
	TIME	MIN.		D. U.	MGALS/D.U.	MGALS	1	2		MGALS	MGALS	MGALS
Hickam MATS Term	23Aug61 2357	<u> </u>		1580.83	0.69594	1100.16	+.08		!	1100.24		
Bishop Museum	24Aug61 0020	37 23		1608.53	0.69594	77.6111	90°+		01	67.6111		+ 19.25
Hickam MATS Term	, 2500	3		1580.97	0.69594	1100.26	+,01		03	1100.24		•
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		٠.					*	; ;				
Hickam MATS Term	23Aug61 2357	23	15	. 07*84	0.6927	54.31	+.08			54.39	1040.89	
Bishop Museum	24Aug61 0020	37 / 23	16	06.07	0.6933	04.21	÷.06		+.02	04.29	1110,16	+ 19.17
Hicksm MATS Term	7500	3	15	78.43	0.6927	54.33	+.01		+.05	54.39	1040.89	,
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1. EARTH TIDE 2. DRIFT BETW	EARTH FIDE DRIFT BETWEEN TRIPS				OBSE!	observer A2C Meyn,#615 Lt Schweninger #61#	ey#61#	615	COMPUT Stin	COMPUTED BY Stinnette	řva ·	0√3€ Sep 61
S. ORIFT DU	DRIFT DURING TRIPS				- INSTR	INSTRUMENT #617	17	,	снескер ву Waring	sckep my Waring R.	ίνα	DAJE Oct 61
TORK O 11.												

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APPENDIX C

BASE STATION DESCRIPTIONS
PRINCIPAL FACTS FOR DETAIL OBSERVATIONS

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•	SURVEY STA	TION DES	CRIPTION		
COUNTRY	STATION DESIGNAT			PROVINCE	**
U. S. A.	Bishop Museum	Pendulum	ı Hawa ij	. Oaho Island	
REFERENCE DETAIL	NEAREST CITY		LATITUDE	LONGITUDE	
Gravity Base	Honolulu		22 ° 20.2	"N 157° 52.4	″W
STATION ELEVATION FT/MTR		PROBABLE	ACCURACY	7	
Unknown	*	<u></u>			
	SOURCE OF IN				
LATITUDE & LONGITUDE		ELEVATION		DATUM	· [
W. H. O. I. Ref. 60-26	. July 1960 Month & Yi	<u> </u>		<u>. L</u>	
observed by A/2c Meyn			CHIEF OF YEAM	*** ***	
Lt. Schweninger	August	1961	L/Lt. J.	B. Schweninger	
	,	L7	3 60 1		
Station is	in room z on	the groun	d floor of t	he Administration	
and Research Annex (no	tneast annex	our laing	at the rear	of the museumu.	
The station is in the	orth comer o	I room Z	at Iloor lev	el which is about	
3 feet below the level	or mie ground	THREGIAT	ETA Offerine		
					
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	SI	URVEY ST	ATION D	ESCRIP	TION				
COUNTRY USA		M DESIGNATE				A PROVI	ece slands		
	HEARE	ST CITY		LATI:	LUDE	N **	LONGITUDE	04'.5	UPP.
STATION ELEVATION FT/HFR	none	·	ESTIMATE				1 1/0	VALT	-7
21		SOURCE	OF INFORMA	TION P	'OR 1				
Woods Hole Oceanograph	/60-26	<u> </u>	Same as		tion	DATU	M		
OBSERVED BY		MONTH &	YEAR	CHIE	OF TEA	M		 ,	
Lt Schweninger & A2C M	evn	Aug 6	O.L.	11/1/3	J. B.	Schwen	inger		
Readings were taken be	side cı	istoms do	or on fi	leld s	ide of	waitin	g room at	the	
MATS Base Terminal.			· · · · · · · · · · · · · · · · · · ·) (···			·	 -
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SURVEY STATION DESCRIPTION									
COUNTRY	STATIO Be:	n DESIGNAT	KOI		STATE OR Hawaiis	PROVI	ends		
	NEARE	st city		21"	100E +		LONGITUDE	57 '	± 2'=
STATION ELEVATION FT/MTR	<u> </u>	<u> </u>	ESTIMATED	ACCU	RACY ±				
		SOURCE C	OF INFORMA		OR :				
LATITUDE & LONGITUDE USC&GS Triangulation D	lagram		ELEVATION			ועדאָם	M .		
onserved by A2C Meyn		MONTH &	YEAR	CHIE	of Team		øer		
DESCRIPTION					(
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SURVEY STATION DESCRIPTION									
COUNTRY USA	STATION DESIGNA Molokai A	Tion irport	Molokai	r provi	NCE Hawaii		<u> </u>		
Gravity Base	NEAREST CITY		LATITUDE .	N "	1.010171175	06,	W "		
STATION ELEVATION FT/47/R	Kualapuu	ESTIMATE	ACCURACY_+	11	1 -01 -	-	***		
441 '''	tource.	plus of informa	or minus 20						
LATITUDE & LONGITUDE Flight		ELEVATION		DATU)M				
Publications enroute sur	plement		Same						
omserved by A2C Meyn. 1/Lt Schweninger	MONTH &		Lt Schwer		•				
DESCRIPTION Observations	were made on	the aspha	lt surface o	n the	field side	of	the		
fence at gate #2 of the	Molokai Airp	ort.							
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	METAL FENCE		•	.0					
	. /			RAM.					
			PAFT			١.			
	GATE		AIRCRAFT						
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•	SURVI	EY STATION	DESCRIP	TION		
COUNTRY U.S.A.	TATION DE	signation Airport		STATE OR Lanai	PROVII (sland	ice   Hawaii
Gravity Base	NEAREST C Lanai	ITY C1 tv	LATI	148 ,	"	LONGITUDE 156 S7 W
TATION ELEVATION PT/ATA		ESTI	ATED ACCU			1 ± 20
1)1)	50	URCE OF INF				
ATITUDE & LONGITUDE		ELEV	ATION		DATU	<b>X</b>
Flt info pub enroute su masemum my A2C Meyn		TH & YEAR	Same	F OF TEAM	L	
Lt Schweninger		Aug 61	1/	Lt Schwer	inger	· · · · · · · · · · · · · · · · · · ·
DESCRIPTION Observations	were made	on the a	sphalt p	avement i	n fro	nt of the
Hawaiian Airline termi	nal next	to the fer	ce and a	concrete	side	walk.
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SURVEY SYNTION DESCRIPTION								
COUNTRY	STATION DESIGNATION		STATE OR PROVIN					
	Laysan Island	7		Islands				
REFERENCE DETAIL	NEAREST CITY	25	146 " "	LONGITUDE				
STATION ELEVATION FT/HTR	PROBABL		RACY					
261 - 9"	SOURCE OF INFORMATION							
LATITUDE & LONGITUDE			Leveling DATU	M				
USC&GS Chart #4186	using n	nean t	ide at 2140 G	CT on 10 Jul 61				
OBSERVED BY	MONTH & YEAR	CHIE	f of Team	•				
Lt Schweninger & A/2C Mey	m July 1961	<u> </u>	1/Lt J B Schw	en <b>inger</b>				
DESCRIPTION Observations	vere made at the USC&C	S tri	anglation sta	tionstamped				
"LAYS 1961" . The station observation was also made	at the top of the wa	east	oi the west	tela lot mom				
the waters edge 10' west	of a US Wildlife refu	ge si	gn. The eleva	tion here is				
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	SURVEY	STATION DE	SCRIP1	rioit	
COUNTRY	STATION DES	GNATION		STATE OR PROVI	NCE.
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REFERENCE DETAIL	NEAREST CIT	Υ	LATIT	TUDE.	LONGITUDE, "
STATION ELEVATION FT/MTR	L	PROBABLI		04	1.73 58
161 - 0"		PROBABLI		<b>'</b> '''' '	
	SOURCE	OF INFORMATION	FOR:	<del></del>	
LATITUDE & LONGITUDE				leveling DATE	
USC&GS Chart #4186		using m		ide at 2220 G	CT on 12 Jul 61
Lt Schweninger & A/2C Me	1	1961	1	Lt J B Schwe	
DESCRIPTION Observations we	re made at	the USCAGS	triar	rolation stat	ion stamped
"Lisianski 1961". The sta	tion is ar	proximately	400	east of the	west beach.
An observation was als	o made at	the top of	the we	est beach app	roximately 30
from the waters edge next	to a US W	lildlife ref	ige s	ign. The elev	ation here is
81 <b>-</b> 0".					
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REFERENCE MODETAIL	NEAREST CITY		ATITUDE	LONGITUDE
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	SOURCE OF I	FORMATION FO	N:	
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USC&GS Chart #4175	MONTH & Y	using mean	tide at 00P5 G	CT on 14 Jul 61
Lt Schweninger and A/20		EAR C	1/Lt Schwening	er .
DESCRIPTION Observations	were made at	a USC&GS to	riangulation ma	rk stamped
"PEARL 1961". The stati	on is approxim	ately 200'	N.W. of the S.	E. beach of
Southeast Island of Pear	1 and Hermes F	leef.		
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COUNTRY USA	French Friga		5	Hawaii	lan I	slands
Gravity Base	NEAREST CITY		LATIN	TUDE 52' 1	<b>y</b> "	LONGITUDE 17 ' W"
STATION ELEVATION FT/W/F		ESTIMATED Pl	ns or	Minus 2 I		
	SOURCE	OF INFORMA				
LATITUDE & LONGITUDE Flight Publication Enroute Su	Information oplement	ELEVATION S	n ame		DATU	
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Gravity Base	NEAREST CITY		LATITUDE 14	' N"	LONGITUDE 31 ' W "
STATION ELEVATION FT/M/T/	<u> </u>	ESTIMATE	ACCURACY 1		
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LATITUDE & LONGITUDE Flig.	ht Information	ELEVATIO	N	DATU	M
Publication Enroute Suprobserved BY A2C Meyn and It J. B. Schweninger		YEAR 61	CHIEF OF T	TEAM B. S	Schweninger
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STATION ELEVATION FT/	# <del>****</del>		PROBABLE	ACCU	TACY		<i></i>	
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DESCRIPTION Observat					Station	at the	hase of	the
concrete steps lea	ading to the	old base	operation	ons	building	at th	e Navy Ai	r
Station-on Sand Is	sland, Midwa	ay. This b	ouilding	is no	ow the co	mmunic	ations ce	nter.
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	SURVEY ST	ATION DE	SCRIPTION		
COUNTRYUSA	STATION DESIGNATION Kure Islam	rion id	STATE OF	PROVI Walia	nce n Islands
Gravity Base	NEAREST CITY		LATITUDE 28°23.5	N"	LONGITUDE
STATION ELEVATION FT/MFR/		ESTIMATED Plu	ACCURACY + or Minus 3	Ft	
		OF INFORMA	TION FOR I		
LATITUDE & LONGITUDE Fligh Publication Enroute Sup	t Information	ELEVATION Same	1	DATE	· ·
OBSERVED BY A2C Meyn and lst Lt. J. B. Schwenin	MONTH &	YEAR	CHIEF OF TEAM Lt J. B. Sch	.mnin	ran
DESCRIPTION Observations	were made on	the conc	rete floor to	the	left of the office
door of the US Coast G	uard Loren Sta	tion on	Kure Island.	The	office is at the
north end of the barra	cks building.	***************************************			
		THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE P	43444 THE PROPERTY OF THE PARTY		. ,
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1361 FORM 0-18 REPLACES 1361 FORM 23 WHICH MAY BE USED

PRIN	CIPA	L FACTS F	OR DET	AIL OBS	ERVATIONS		
COUNTRY USA - Hawaii	an Is	slands					
NAME OF GRAVITY BASE Hickam MATS	Term:				978,933.		
CLASSIFICATION OF OBS. Detail		TYPE ELI Spir	EVATION It Lev	eling		EAR OF OBSER 1961	
ACCURACY OF OBSERVATION +0.5 mgals	)NS ³¹			INSTRUI Worde	MENT n Master,	615 and 617	7
OBSERVER Lt J. B. Schweninge	r and	1 A2C Mey	n	a andre ministrator vivos a 14 may 60	ng ar zwinklan v Swall and and and and and and and and and and		
STATION NAME OR NO.	LA	TITUDE	LON	GITUDE	ELEV. FT/XXX	ESTIMATED ACCURACY ±	MEAN OBSERVED G MGAL
Keaau	19	38	155	02	328.12	1.0	978,858.9
Pahoa	19	30	154	57	674.84	1	851.6
Kalapana	19	22	154	58	10.81		867.0
Pohoiki	19	27	154	51	37.10	1	872.2
Pahala	19	12	1.55	28	1036		798.6
Hilea	19	08	3.55	32	302.41		846.4
Naalehu	19	03	155	36	673.86		817.2
Kealakekua	19	39	156	Ol	1371.75		773.9
Puuanahulu	19	48	155	51	2136		714.9
Auwaiakeakua Bridge	19	52	155	43	2522		722.9
	19	51	155	39	4732		601.0
Waikii USGS BM Hwy 2.8 miles S. of Mtn View	19	32	155	07	2120.07		757.6
Volcano House	19	26	155	16	3972.54		671.2
Hwy 11 USGS BM 3640	19	25	155	19	3640	1.0	688.4
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REMARKS							

1381 Form 62 0-32 *Relative to Gravity Base Stations

COUNTRY USA - Hawaiia	n Isl	ands							
NAME OF GRAVITY BASE Hickem MATS T	·· · · · · · · · · · · · · · · · · · ·	**************************************		VALUE	OF GRAVITY 978,933.7		Birkatorial Principles providence and a speaking company of the A		
CLASSIFICATION OF OBS.		TYPE EL	EVATIO			AR OF OBSE	RVATION		
Detail Spirit Leveling 1961									
ACCURACY OF OBSERVATION ±0.5 mgals	)NS**			INSTRUI Word	MENT en Master,	615 and 6	17		
OBSERVER Lt J. B. Schweninge	r and	A2C Mey	n				`		
STATION NAME OR NO.	LA	TITUDE	LONG	GITUDE	ELEV. FT/XXX	ESTIMATED ACCURACY	MEAN OBSERVED G MGAL		
Makawao USGS BM	20	51.5	156	19	1638.73	1.0	978,811.0		
Upper Paia USC&GS BM	20	54	156	22	165.54	<b>A</b>	884.5		
Kihei USC&G" BM	20	47	156	28	7.46		896.2		
Maleakala Crater	20	44.5	156	14	9324.81		299.4		
laleakala USC&GS Trian. Station Kolekole	20	42.5	356	15.5	10012.0		228.0		
-l Bridge	21	57	159	.28.1	641.24		979,007.0		
alahed USGS BM 700	21	55.5	159	31.8	700.13		978,976.9		
ort Allen USGS BM 35	21	54	159	35.3	35.24		979,004.4		
kaimea USGS BM 9	21	57.4	159	40.4	9.09		021.0		
kilua Bridge	22	02.,6	1.59	20.3	16.80		061.0		
apaa Armory	22	5	159	19	6.72		058.0		
ahal Point Light House	21	08.8	159	1.8	24.42		049.9		
loolau School	22	11.7	159	21	320		044.2		
ilauea Tele. Exchange	22	12.2	159	24.6	320		044.6		
Manalei Bridge BM 17	22.	12.7	159	28.8	17.03		070.0		
ainiha Power Hse BM101	22	11.8	159	33.5	100.29		073.4		
okee 109 AC&W Sta	22	09	159	38.5	4270		978,767.8		
wy 19 S. of Pepcekeo	19	50	155	-06	461.80		868.6		
lanue Bridge	19	56	155	09 ·	212.09		900.6		
ilau Bridge	7.4	59	155	14	439.30		884.6		
Vapunahina Bridge	20	03	155	23	692.68		877.4		
lonokaa	20	05	155	28	1113.87		857.0		
lukuihael <b>e</b>	20	08	155	34	730.06		883.8		
loimea	20	03	155	45	3160.99		740.8		
anukona Landing	20	11	155	59	11.33		870.0		
Malawa	20	1.3	155	42	263.68	+	885.1		
Makahuna Bridge	20	03	155	50	19.85	1.0	896.2		

1381 Form 62 0-32 *Relative to Gravity Base Stations

PRI	NCIPA	L FACTS	FOR DET	AIL OB	SERVATION	<b>1</b> S	
COUNTRY USA - Hawaiia	n Isl	ands					
NAME OF GRAVITY BASE Hickem MATS T	ermir	nal, Oahu		VALUE C	F GRAVIT 978,933		***************************************
CLASSIFICATION OF OBS. Detail		TYPE ELI Spiri	VATION t Level	ing	Y	EAR OF OBSER 1961	CVATION
ACCURACY OF OBSERVATIO	NS*			INSTRUM Worden	ENT Master,	615 and 617	
OBSERVER Lt J. B. Schweninge	r and	l A2C Mey	n	·	garagus e yang penyebb bi bayang dan penyebbanan		
STATION NAME OR NO.	LA	TITUDE	ľong	ITUDE	ELEV. FT/MTR	ESTIMATED ACCURACY	MEAN OBSERVED G MGAL
Kualapuu BM 878	21	02	157	09	877.92		978,916.4
Kalaupapa Lookout TBM	21	10.5	157	00	161.3.5	<b>1</b> • • • • • • • • • • • • • • • • • • •	852.5
Kaunakakai USGS BM	21	05.5	157	01.5	4.83		958.9
Highway 45 Bridge	21	04	156	57	10.18		950.3
Kamalo USGS BM 39	21	03.5	156.	52	39		949.7
Pukoo Fish Pond BM 2	21	04.5	156	48	7		953.2
Kanaha Pt USGS BM 48	21	07	156	44.5	48.82		955.4
Halawa USGS BM 25	21	09.5	156	44.5	25.97		962.8
Puu Nana Reservoir BM	21	09	157	10	1380.95		898.2
MaunaLoa USGS BM 1102	21	07.5	157	13	1102.53		905.8
Waieli Trian.Sta.	21	06.5	157	14.5	631		927.8
Kaeo Trian. Sta.	21	13	157	14	584.		919.0
Kahakuloa USGS BM	21	00	156	33.5	203.39		896.0
Honokowai Hwy 30	20	57	156	41.5	19.0		904.0
Lahaina USGS BM	20	52.5	156	41	7.57		897.8
Olowalu Bridge	20	49	156	38	25.32		897.6
Intersec. Hwy 30 & 31	20	50.	156	32	163		886.4
Wailuku Court House	20	53	156	30.5	331.06		882.4
Hwy37 Makena Jct Hwy31	20	40	156	24 .	1804.88		778.6
Kepuni Bridge	20	37.5	156	15.5	884		840.6
PuuManeoneo Trian.Sta.	20	38	156	10.3	3.56		871.1
Kipahulu USGS BM 192	20	39	156		191.52		899:2
Muolea USGS BM 335	20	41:3	156	01.5	335.48		905.6
Koblau Ditch Intake	20	49	156	08	1273.84		845.0
Nahiku USGS BM 44-M-192		48.5	156	06	927.96		872.2
Kailua USGS BM M-11-192	3 20	54	156	13.5	658.94	¥	869.6
Haiku USGS BM	20	55	156	19.5	512.45	1.0	877.6

1381 Form 62 0-32 **Relative to Gravity Base Stations